Vol. 929 Number 3

OFFICIAL GAZETTE

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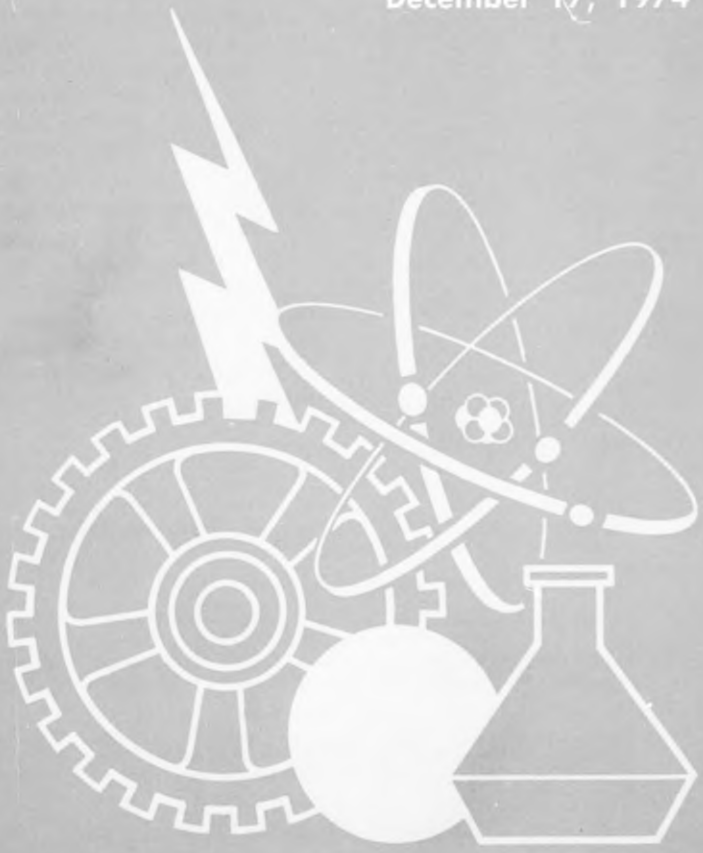
PATENTS

December 17, 1974



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

December 17, 1974 Volume 929 Number 3

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PATENT OFFICE NOTICES

Service by Publication

Alexander G. Makowski

In accordance with Rule 47(a) of the Rules of Practice of the United States Patent Office in Patent Cases, notice is hereby given of the filing on Nov. 24, 1972, of an application for patent entitled "Free Flow, Interlocking Packing Material of Low Bulk Density," on behalf of Alexander G. Makowski, whose last known address is P.O. Box 7223, Wilmington, Del. 19803. The application was made in compliance with Rule 47(a) and 35 U.S.C. 116 by Arthur Graham and Gunter Fuss without execution by the said Alexander G. Makowski. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Alexander G. Makowski in connection with the said application must be taken within thirty days of the publication of this notice.

WILLIAM FELDMAN,
Acting Assistant Commissioner for Patents.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,000,013, W. J. Traenkle, WITHIN-THE-SHOE SOCK, **filed** June 20, 1974, D.C., S.D.N.Y., Doc. 74–C–2642, *William J. Traenkle* v. *Lindsey Moretz Sales Co. Inc.*

3,055,705, K. H. Wilson, FOLDING TABLE AND SEAT STRUCTURE, **filed** Jan. 25, 1971, D.C., N.D. Ind. (South Bend), Doc. 71–S–8, *Kermit H. Wilson and Sico Incorporated* v. *The Peabody Seating Co., Inc. and American Standard, Inc.* Plaintiffs take nothing by their complaints; and defendants take nothing by their counterclaims by consent of both parties and with prejudice, June 18, 1974.

3,239,145, A. D. Russo, DISPENSING CONTAINER FOR AIR TREATING GEL, **filed** July 31, 1972, D.C., C.D. Calif. (Los Angeles), Doc. 72–1748–AAH, *Blue Cross Laboratories* v. *Airwick Industries, Inc.* A permanent injunction has been issued against plaintiff enjoining and restraining them from infringing upon said patent, June 21, 1974.

3,310,268, H. Kramer, HINGE BRACKETS, **filed** May 26, 1967, D.C., S.D.N.Y., Doc. 67–C–2079, *Hyman Kramer, doing business as Hy Kramer Enterprises* v. *Duralite Company, Inc.* Opinion considered as finding of fact and conclusions of law under Rule 52 (a) of FRCP, device did not rise to the level of an invention, Dec. 20, 1973. **Same, filed** May 26, 1967, D.C., S.D.N.Y., Doc. 67–C–2081, *Hyman Kramer doing business as Hy Kramer Enterprises* v. *G. & A. Machine Works, Inc.* Opinion considered as findings of fact and conclusions of law under Rule 52 (a) of FRCP, device did not rise to the level of an invention, Dec. 20, 1973.

3,368,432, K. F. Halls, SLIDING SIDE JAW WRENCH HAVING A PERFORATED DRIVE BELT; **3,555,939,** same, ADJUSTABLE OPEN END WRENCH, **filed** Mar. 14, 1972, D.C., W.D. Okla. (Oklahoma City), Doc. 72–181–C, *Eugene E. Petersen* v. *Fee International, Ltd.* Judgement in favor of plaintiff, defendants permanently enjoined from infringing said patents, June 5, 1974.

3,408,523, Demarest and Karlson, LIGHT BULB WITH A PLURALITY OF INDEPENDENTLY CONNECTED FILAMENTS FOR INDICATING GRAPHICS SYMBOLS, **filed** May 15, 1970, D.C., S.D.N.Y., Doc. 70–C–2011, *Chicago Miniature Lamp Works* v. *Refac Technology Development Corp.* Filed order that the above action is discontinued, Oct. 6, 1972.

3,430,376, Drybread, Sr. and Fritz, LICENSE PLATE HOLDER, **filed** Apr. 5, 1974, D.C., S.D.N.Y., Doc. 74–1554, *Dem-O-Jiffy Plate, Inc. and John S. Drybread, Sr.* v. *Unival Corporation et al.*

3,443,285, Goldhammer and Mahrt, APPARATUS FOR OPENING BALES OF FIBERS, **filed** Mar. 28, 1974, D.C., W.D.N.C. (Charlotte), Doc. C–C–74–68, *Schubert & Salzer Maschinenfabrik Aktiengesellschaft* v. *Automatic Material Handling, Inc. and Parkdale Mills, Inc.*

3,452,387, Jerila and Holmes, CLOSING DEVICE FOR DOORS, **filed** Aug. 30, 1972. D.C., E.D. Ill. (Chicago), Doc. 73c771, *Ajax Hardware Corporation* v. *National Lock, a div. of Keystone Consolidated Industries.* On stipulation of parties, cause dismissed with prejudice, Mar. 19, 1974.

3,452,851, L. Holmes, Jr., TYPEWRITER BASEPLATE ENABLING MACHINE OPERATION BY AND GENERATION OF ELECTRICAL SIGNAL, **filed** Apr. 5, 1974, D.C. Del. (Wilmington), Doc. 74–65, *Tycom Corporation* v. *Redactron Corporation and Sperry Rand Corporation.*

3,465,654, H. Fox, DRAIN DEVICE, **filed** June 28, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV–74–1805–RJK, *Harco Products, Inc.* v. *White Cap Plastic Products, Inc.*

3,503,760, W. M. Allen, METHOD OF SMOKING A COMESTIBLE PRODUCT, **filed** June 6, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1538, *Beatrice Foods Co.* v. *Bluebird Inc. et al.*

3,555,939. (See 3,368,432.)

3,619,675, S. M. Baker, CONTROL ROD DRIVE MECHANISM, **filed** Apr. 9, 1974, D.C., E.D. Calif (Sacramento), Doc. S–74–130, *Royal Industries, Inc.* v. *Sacramento Municipal Utility District.*

3,632,879, R. Freisinger, AUTOMATIC TELEPHONE DIALER FOR EMERGENCY MESSAGES, **filed** June 3, 1972, D.C.N.J. (Newark), Doc. C–964–72, *Atlantic Metal Products Inc.* v. *Napco Security Systems Inc.* Order of dismissal of action, June 26, 1974.

3,641,391, A. R. Badewitz, DEVICE FOR RESTORING CATHODE EMISSION IN CATHODE RAY TUBE GUNS, **filed** Mar. 26, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c761, *Beltron Inc. and Appleway Electronics, Inc.* v. *RCA Distributing Corp.* Order of dismissal—order complaint and counterclaim be dismissed without prejudice, Jan. 10, 1974.

3,665,477, Budrow and Reed, ELEVATABLE AND FOLDABLE ANTENNA, **filed** Mar. 4, 1974, D.C., W.D. Mich. (Grand Rapids), Doc. G74–65 CA, *Barker Manufacturing Company, Inc.* v. *RS Electronics-Grand Rapids, Inc.*

3,674,401, Annis, Jr. and Kyritsis, APPARATUS FOR INJECTION MOLDING ARTICLES OF FOAM MATERIAL; **3,776,989,** same, METHOD FOR INJECTION MOLDING ARTICLES OF FOAM MATERIAL INVOLVING AUTOGENOUS FLOW; **3,801,686,** Kyritsis and Simmonds, Jr., METHOD OF INJECTION MOLDING ARTICLES OF FOAM MATERIAL, **filed** Apr. 16, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1056, *USM Corp.* v. *Service Plastics, Inc.*

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE, **filed** Apr. 24, 1974, D.C., W.D.N.C. (Statesville), Doc. St–C–74–16, *Tights, Inc.* v. *J. P. Stevens & Co., Inc.*

3,728,180, Morton and Morton, STEAM HUMIDIFIER WITH CENTRIFUGAL SEPARATOR; **3,730,899,** Messerschmidt, Jr., Heyman and Johnsen II, POWDERLESS ETCHING BATH ADDITIVE, **filed** May 10, 1973, D.C.N.J. (Newark), Doc. 657–73–C, *Philip A. Hunt Chemical Corporation* v. *Mona Industries, Inc.* Stipulation and order of dismissal of action, Feb. 4, 1974.

3,729,763, R. M. Coley, WHEEL WASHING APPARATUS, **filed** June 20, 1974, D.C., M.D.N.C. (Greensboro), Doc. C–74–184–G, *Vend-A-Matic, Inc.* v. *Automatic Car Wash, Incorporated, doing business as MacCleen's of Greensboro.*

3,730,899. (See 3,728,180.)

3,741,107, Boyd, Bond, Elliott, Gisolfi and Merklin, PORTABLE REFUSE HANDLING APPARATUS, **filed** June 26, 1973, D.C. Md. (Baltimore), Doc. 73–647–K, *Union Environmental Corporation and John A. Boyd* v. *Board of Education of Montgomery Compackager Corporation et al.* Order that case be dismissed without prejudice, Apr. 26, 1974.

3,744,200, E. K. Rice, PRECAST CONCRETE BUILDING CONSTRUCTION, **filed** Nov. 2, 1973, D.C., N.D. Tex. (Dallas), Doc. CA–3–4696–C, *Unicon Parking Structures, Inc. and Edward K. Rice* v. *Young Hadawi Inc., Ben Young and Nabil Hadawi.*

3,751,737, B. E. Mustee, FREE-STANDING SHOWER STALLS, **filed** Mar. 28, 1974, D.C., W.D. Ky. (Louisville), Doc. C–74–124–L(B), *VBM Corporation* v. *E. L. Mustee & Sons, Inc.*

3,776,989. (See 3,674,401.)

3,801,686. (See 3,674,401.)

Certificates of Correction for the Week of Dec. 17, 1974

P.P. 3,595	3,791,205	3,829,315	3,837,227
Re. 28,187	3,791,397	3,829,391	3,837,230
D. 228,888	3,791,441	3,829,437	3,837,262
D. 232,559	3,795,375	3,829,495	3,837,417
D. 232,574	3,798,216	3,829,525	3,837,470
D. 233,075	3,798,457	3,830,275	3,837,485
3,338,167	3,799,055	3,830,464	3,837,491
3,540,688	3,799,297	3,830,727	3,837,661
3,617,251	3,801,084	3,830,736	3,837,705
3,649,157	3,801,766	3,830,843	3,837,715
3,664,332	3,803,552	3,830,934	3,837,894
3,665,460	3,803,634	3,830,959	3,837,966
3,666,479	3,806,491	3,831,358	3,838,090
3,678,039	3,807,453	3,831,806	3,838,124
3,681,385	3,808,095	3,832,204	3,838,300
3,683,608	3,809,009	3,832,215	3,838,442
3,687,690	3,811,006	3,832,490	3,838,465
3,694,201	3,812,029	3,832,491	3,838,574
3,705,827	3,812,701	3,833,062	3,838,600
3,715,584	3,813,399	3,833,303	3,838,721
3,716,347	3,813,537	3,833,337	3,838,831
3,717,698	3,813,609	3,833,362	3,838,873
3,723,911	3,813,758	3,833,408	3,838,910
3,729,806	3,814,196	3,833,417	3,838,971
3,732,469	3,814,246	3,833,465	3,839,049
3,734,687	3,814,855	3,833,487	3,839,138
3,735,803	3,815,695	3,833,514	3,839,252
3,739,691	3,816,346	3,833,675	3,839,269
3,741,413	3,816,349	3,833,690	3,839,716
3,744,410	3,817,880	3,834,200	3,839,769
3,751,207	3,818,113	3,834,374	3,840,030
3,752,875	3,819,395	3,834,445	3,840,156
3,757,732	3,819,474	3,834,462	3,840,224
3,758,073	3,820,233	3,834,494	3,840,320
3,759,879	3,820,710	3,834,549	3,840,389
3,762,316	3,820,950	3,834,700	3,840,458
3,764,335	3,820,958	3,834,803	3,840,469
3,766,012	3,821,185	3,834,950	3,840,569
3,767,645	3,821,703	3,834,978	3,840,625
3,767,734	3,821,949	3,835,204	3,840,711
3,768,820	3,822,245	3,835,227	3,840,760
3,769,828	3,822,358	3,835,297	3,840,806
3,770,015	3,822,543	3,835,355	3,840,831
3,772,254	3,822,832	3,835,439	3,840,847
3,772,349	3,823,084	3,835,684	3,840,930
3,772,512	3,823,299	3,835,692	3,841,012
3,775,360	3,823,594	3,835,701	3,841,076
3,775,385	3,823,833	3,835,843	3,841,162
3,775,797	3,824,467	3,836,139	3,841,276
3,775,937	3,824,545	3,836,173	3,841,351
3,776,038	3,825,002	3,836,237	3,841,482
3,776,112	3,825,619	3,836,327	3,841,702
3,777,615	3,825,661	3,836,349	3,841,862
3,778,367	3,825,691	3,836,466	3,842,013
3,779,182	3,825,988	3,836,626	3,842,173
3,781,464	3,827,113	3,836,640	3,842,239
3,781,884	3,827,315	3,836,679	3,842,394
3,782,474	3,827,516	3,836,743	3,842,790
3,782,956	3,827,682	3,836,769	3,842,791
3,786,009	3,827,905	3,836,874	3,843,278
3,789,002	3,828,341	3,836,875	3,843,432
3,789,538	3,828,358	3,836,988	3,843,503
3,790,524	3,828,480	3,837,137	3,843,528
3,790,550	3,828,709	3,837,212	3,843,962

PATENT EXAMINING CORPS

WILLIAM FELDMAN, Acting Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 23, 1974

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds: Inorganic Compositions: Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-29-73
GENERAL ORGANIC CHEMISTRY, GROUP 120—R. F. BURNETT, Acting Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids, Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-18-73
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	12-26-73
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-11-74
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-3-74
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-26-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-19-73
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-3-73
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-11-74
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-20-73
DESIGNS, GROUP 290—C D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-4-73
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-73
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	2-11-74
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-14-73
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-15-74
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	3-22-74

Expiration of patents: The patents within the range of numbers indicated below expire during November 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,811,722 to 2,814,801, inclusive
Plant Patents..... Numbers 1,656 to 1,660, inclusive

REISSUE PATENTS

GRANTED DECEMBER 17, 1974

ERRATA

For CLASS	See PATENT NO.
004–110	28,278
053–003	28,277
141–006	28,275
182–006	28,273
353–044	28,274
195–096	28,276

REISSUES

DECEMBER 17, 1974

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

28,273

RESCUING DEVICE

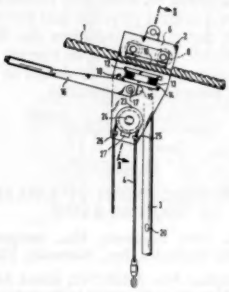
Otto Brda, 10 Breitenau D–8112, Bad Kohlgrub, Germany

Original No. 3,703,218, dated Nov. 21, 1972, Ser. No. 157,516, June 28, 1971. Application for reissue Oct. 19, 1973, Ser. No. 407,798

Claims priority, application Germany July 20, 1970, P 20 35 933.5

Int. Cl. A26b *1/14*

U.S. Cl. 182—6 **14 Claims**



1. [REscuing] *Rescuing* device for rescuing persons from ropeways, chairlifts and similar means for transporting persons along cables, ropes or the like over a certain height difference above the ground, comprising

a. a supporting member;

b. rolling means provided on said supporting member for movement along the rope or cable;

c. frictional braking means, provided on said supporting member and movable thereon, which in a first position contact the rope or cable to exert a frictional braking force on the same and in a second position provide a predetermined space between the braking means and the rolling means;

d. spring means acting on said frictional braking means;

e. an adjustable member to compress said spring means to increase the pressure acting on said frictional braking means;

f. cylinder means supported on said supporting member by a free-wheeling bearing means, which allow a rotation of the cylinder means in one direction of rotation and block their rotation in the other direction of rotation;

g. rope means, wound around the cylinder means at least one and a half times;

h. belt means releaseably connected to the first end of said rope means, whereby this first end acts on said cylinder means in the direction, in which a rotation of the cylinder means is blocked;

i. transporting means connected to said supporting member; such that a first person sitting on the transporting means and operating the adjustable member can slide down an inclined rope or cable into the vicinity of a second person to be rescued and fasten said belt means around said second person, and wherein the second person can controlledly be moved down by gradually releasing the second end of said rope means.

28,274

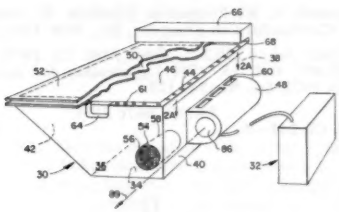
LOW PROFILE EPISCOPIC PROJECTOR AND OPAQUE MATERIALS THEREFOR

Gerald Altman, 41 Westminster Road, Newton Centre, Mass. 02154

Original No. 3,778,142, dated Dec. 11, 1973, Ser. No. 81,987, Oct. 19, 1970, which is a continuation-in-part of applications Ser. No. 742,423, July 3, 1968, now Patent No. 3,614,199, and Ser. No. 780,313, Dec. 2, 1968, now abandoned. Application for reissue Apr. 2, 1974, Ser. No. 457,277

Int. Cl. G03b *21/06, 21/132*

U.S. Cl. 353—44 **4 Claims**



1. A large copy optical projector capable of imaging a generally horizontal copy sheet on a generally vertical viewing screen spaced from said projector, said copy sheet having *a top face and a bottom face, at least one of said faces being associated with a reflector which is in optical communication with said bottom face,* [an upper face and a lower face, said lower face being reflectorized,] said optical projector comprising:

a. housing means defining an enclosed chamber, said housing means having a substantially horizontal upper portion, said upper portion having a first opening throughout a major portion of its area;

b. a flat Fresnel lens at said opening in said upper portion, said Fresnel lens being substantially coextensive with said opening in said upper portion;

c. said copy sheet, when releasably placed on said Fresnel lens, being substantially coextensive therewith and having substantially the entire upper face of said copy sheet accessible visually and manually to an operator;

d. said housing means having a second opening, objective lens means at said second opening for receiving imaging light along an imaging path and defining a

projection axis that is directed toward said generally vertical viewing screen;

e. lamp means in said chamber for directing illuminating light along an illuminating path;

f. an oblique plane mirror underlying said Fresnel lens within said chamber, an edge of said mirror being adjacent to an edge of said Fresnel lens;

g. said illuminating light diverging in said illuminating path along a first illuminating axis communicating with said oblique plane mirror and then being reflected along a second illuminating axis communicating with said Fresnel lens;

h. said imaging light reflected from said copy sheet being converged by said Fresnel lens in said imaging path along a first imaging axis communicating with said oblique plane mirror and then being reflected along a second imaging axis communicating with said objective lens means;

i. said lamp means and said objective lens means being disposed at one side of said oblique plane mirror;

j. said projection axis being disposed externally of the region directly overlying said Fresnel lens;

k. said Fresnel lens directing substantially parallel illuminating light to said bottom face of said copy sheet and receiving substantially parallel imaging light from said bottom face of said copy sheet; and

l. said chamber being substantially light tight with respect to stray light therewithin when said copy sheet is superposed on said Fresnel lens.

28,275

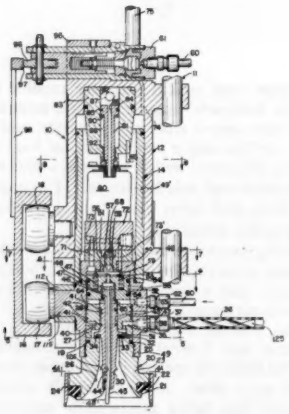
CONTAINER FILLING APPARATUS

Kenneth F. M. Friendship, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Original No. 3,720,242, dated Mar. 13, 1973, Ser. No. 80,895, Oct. 15, 1970. Application for reissue Mar. 23, 1973, Ser. No. 344,129

Int. Cl. B67c *3/06*

U.S. Cl. 141—6 **31 Claims**



1. In a container filling machine, a filling head which comprises a hollow cylindrical housing having a downwardly opening, upper housing member and a lower housing member in sliding telescoped relation within the upper housing member, a sealing bell mounted on the lower end of said lower housing member which is adapted to be brought into sealing engagement with the mouth of a container positioned in vertical alignment beneath the same when the housing member is lowered, a hollow liquid product distributor mounted in said lower housing member which has a passageway connecting with a product inlet port for directing a liquid product through said lower housing member and into said container, a fluid product supply line connected with said product inlet port, a fluid control valve in said product supply line, a device in said supply line immediately adjacent said inlet port for creating extreme turbulence and high pressure drop, a product feed valve assembly having a body member mounted in said product distributor for axial movement between valve opening and closing positions so as to control the entry of the product into said container, a piston mounted for axial sliding movement in said lower housing member and connected to said feed valve body member, resilient means to normally hold said feed valve body member in valve closing position, means for supplying counter pressure which is operative to pressurize said container and to move said product feed valve to open position, fluid means operative on said piston to move said product feed valve to closed position, a control valve for said piston operating fluid means, and means actuated upon the filling of the container to a predetermined level to operate the control valve for said piston operating fluid means so as to move said product feed valve to closed position.

28,276

MILK FERMENTING PRODUCT AND METHOD OF MAKING SAME

Stewart M. Farr, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

No Drawing. Original No. 3,420,742, dated Jan. 7, 1969, Ser. No. 404,526, Oct. 16, 1964, which is a continuation-in-part of abandoned application Ser. No. 285,858, June 6, 1963. Application for reissue Nov. 19, 1973, Ser. No. 417,134

Int. Cl. C12k *3/00*

U.S. Cl. 195—96 **5 Claims**

1. The method of producing a mixed bacterial concentrate *useful for culturing milk which comprises:*

(*a*) separately incubating in separate culture media two types of bacteria, the first type being selected from the group consisting of Streptococcus lactis, Streptococcus cremoris, Lactobacillus bulgaricus and Streptococcus thermophilus *which produce lactic acid wherein the incubation culture medium contains skim milk and wherein during the incubation the lactic acid produced is neutralized as the pH of the medium drops by adding a neutralizing agent to maintain the growth of the bacteria,* and the second type being selected from the group consisting of streptococcus citrovorus and Streptococcus paracitrovorus, *wherein the culture medium contains skim milk or a digest milk to produce bacteria which are centrifugable from the media to form a concentrate;*

(*b*) concentrating the respective media to obtain separate concentrates of the two bacteria[,] *containing at least about* $10x10^9$ *cells/ml. each;*

(*c*) mixing together the two types of bacteria in the desired proportions to produce a mixed concentrate having closely controlled amounts of the two types of bacteria therein without permitting further growth of the bacteria; and

(*d*) then freezing the mixed concentrate so that it can be stored for a long time without major loss in the viability of the bacteria.

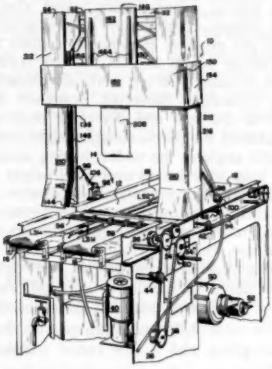
28,277

METHOD AND APPARATUS FOR INSERTING A THREE-SIDED WRAP

James C. Wright, Golden, Colo. and Peter Nemeth, Den Haag, Netherlands, assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Original No. 3,716,960, dated Feb. 20, 1973, Ser. No. 99,156, Dec. 17, 1970. Application for reissue Sept. 24, 1973, Ser. No. 400,335

Int. Cl. B65b *11/06, 41/16*
U.S. Cl. 53—3 18 Claims



1. The three-sided wrap inserting attachment for use with a bottom wrap inserter of the type having a horizontal conveying surface defined by longitudinally-aligned incoming and outgoing conveyors separated by a coverplate having a transverse web-receiving slot therein, web-feeding means located beneath the web-receiving slot operative upon actuation to feed a length of web up through the latter from a supply roll thereof, web-severing means located between the web-feeding means and coverplate operative upon actuation to cut a length of web free of the supply roll, and drive means operatively connected to the incoming and outgoing conveyors and to the web-feeding means, which comprises: frame means defining an upstanding arch mountable atop the conveying surface in position to bridge the web-receiving slot therein, said arch having an opening therethrough sized to pass a stack of articles to be bundled; web-guiding means carried by the frame means on opposite sides of the arch and at the ends of the transverse slot, said web-guiding means being operative upon actuation to extend and engage the side margins of the web as it emerges from the slot, and said means being adapted when so extended to guide said web upwardly therebetween; web retaining means carried by the frame means at the top of the arch, said means being operative upon actuation to engage and hold the web while the web-guiding means is retracted to release the side margins of the latter and open a passage for the movement of a stack therebetween; first servo-motor means operatively connected to the web-guiding means; second servo-motor means operatively connected to the web-retaining means; and, control means connected to the first and second servo-motor means operative in response to the movement of a stack onto the outgoing conveyor surface to actuate the first servo-motor means and deactivate the second.

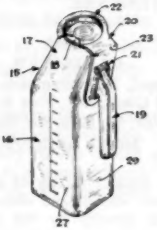
28,278

DISPOSABLE URINAL

Anton G. Borse, Hinsdale, Ill., assignor to Borse Plastic Products Corp., Hinsdale, Ill.

Original No. 3,716,871, dated Feb. 20, 1973, Ser. No. 176,840, Sept. 1, 1971. Application for reissue Sept. 28, 1973, Ser. No. 401,661

Int. Cl. A47k *11/00;* A61g *9/00*
U.S. Cl. 4—110 12 Claims



1. A plastic blow-molded disposable urinal comprising an elongated hollow body substantially square in cross section, a neck extending from the body tapering to a mouth substantially circular in cross section, the axis of the neck extending angular to the axis of the body, an elongated hollow handle integral with the neck extending substantially parallel to the body and defining an open-ended handle to permit hooking the urinal onto a rail or the like, the connection between the handle and the neck forming a radial wall facing the open end of the handle, said handle being pinched and closed at the neck to define a splash deflector within the neck for preventing urine from entering the handle, said pinched portion of the handle including a connecting link between the neck and handle of a thickness substantially less than the thickness of the handle, stiffening rib means on the connecting link between the handle and neck, tiny air hole means in said stiffening rib means to permit air to enter the handle during molding thereof, said hole means being too small to permit urine to pass therethrough, and a cap including a locking plate coacting with the pinched portion of the handle and a closure portion for snap fit into the mouth.

PLANT PATENTS

GRANTED DECEMBER 17, 1974

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,660
CHRYSANTHEMUM PLANT

Barrie John Machin, Chichester, England, assignor to Frampton's Nurseries Limited, Chichester, England

Filed Apr. 12, 1973, Ser. No. 350,627
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—81 **1 Claim**

1. A new and distinct variety of *Chrysanthemum morifolium* Bailey, substantially as shown and described, characterized particularly as to its novelty by the unique combination of a deep red purple color, a deep incurving flower form, strong and uniform response under winter light conditions, and blooms having an average diameter of about 9 cm. when fully open.

3,661
GLADIOLUS

George M. Ruppel, Bridgehampton, N.Y., assignor to Selected Glads, Inc., New Albany, Ind.

Filed Nov. 16, 1972, Ser. No. 307,010
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—85 **1 Claim**

1. A new and distinct variety of gladiolus plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its extremely large size and its peach color.

3,662
ILEX BLUE ANGEL

Kathleen K. Meserve, St. James, N.Y., assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Aug. 9, 1973, Ser. No. 387,042
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—65 **1 Claim**

1. A new and distinct variety of Ilex plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a compact, densely branched, dwarf and vigorous growth habit, an abundance of distinctive, glossy, evergreen leaves of "Christmas Holly" type, with coarse, spiny teeth and wavy, crinkled margin, and more cold tolerant than other red berried, evergreen Ilex, with such glossy, attractive leaves and with stem and leaf color giving an overall bluish effect and bearing dark red berries of good size and having year around ornamental value particularly appropriate to landscape and environmental needs.

3,663
PERPETUAL FLOWERING CARNATION PLANT

Giacomo Nobbio, Duca degli Abruzzi n, 85, San Remo, Italy

Filed Dec. 27, 1973, Ser. No. 428,893
Claims priority, application Italy May 29, 1973, 50,291/73
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A perpetual flowering carnation of slender growth, having flowers colored Primrose yellow with shades of Chartreuse green, characterized in that the first plant of this variety was obtained by stabilizing a bud mutation ("Sport") of the yellow flowered variety of perpetual flowering hybrid called "Alice," said plant having the following unique combination of characteristics:

a. *from the physical standpoint*: a plant that grows to an average height of 100–120 cm. from the ground, while remaining erect, vertical; remarkably sturdy, with numerous flowering branches starting from close to the soil and diverging only slightly from the axis of the plant, straight, rigid, with sometimes a slight angle at the nodes; having abundant foliage, with long wide leaves over total height of plant, leaf stems slightly divergent, curved downwards in an arc or slightly bent over, sometimes forming a circle or spiral; having average to large flowers of very regular shape, regularly rounded outline, slightly scalloped and delicately indented, well developed outer petals, center of the flower averagely raised and full, central petals free, vertical, folded or curly, with the corolla colored Primrose yellow with shades of Chartreuse green and a few radial streaks tinted with white;

b. *from the physiological standpoint*: a plant that is resistant to disease, and is more than sufficiently hardy for industrial production in different types of soil; that is perpetual flowering, with many flowers, which are resistant to inclemency of weather and to discoloration from sunlight, withstand transport and packing well, which last well after being cut and are eminently suited for commerce and export; and the flowers and other parts of the plant being suitable for reproduction by agamic means.

3,664
ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 6, 1973, Ser. No. 422,207
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—21 **1 Claim**

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous, upright plant, large deep red buds and flowers with especially prominent white veining on the reverse of the petals.

3,665
ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 6, 1973, Ser. No. 422,171
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—19 **1 Claim**

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique

combination of its upright and well branched habit of growth; its uniform, long lasting flower color, its lack of strong flower fragrance.

3,666

ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Oct. 24, 1973, Ser. No. 409,270

Int. Cl. A01h 5/00

U.S. Cl. Plt.—12 1 Claim

1. A new and distinct cultivar of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its vigorous, upright, well branched habit of growth; abundant quantities of blooms which are a clear Rose Madder on the upper sides of the petals while the under sides are a very light tint of Rose Madder; dark Parsley green, glossy foliage and lack of fragrance.

3,667

PEONY PLANT

Carl George Klehm, Arlington Heights, Ill., assignor to Klehm Properties, Inc., Arlington Heights, Ill.

Filed Oct. 24, 1973, Ser. No. 409,171

Int. Cl. A01h 5/00

U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of peony plant substantially as herein shown and described, characterized by the blend and combination soft pink and cream colors of its bomb shaped flower form, the relatively short height of the plant growth, and its profuse production of flowers borne on sturdy, stiff stems.

3,668

ROSE PLANT

Carl Meyer, Cleves, Ohio, assignor to Geo. J. Ball Inc., West Chicago, Ill.

Filed Sept. 28, 1973, Ser. No. 401,881

Int. Cl. A01h 5/00

U.S. Cl. Plt.—20 1 Claim

1. A new and distinct garden variety of hybrid tea rose plant substantially as herein shown and described, characterized by the fluorescent red coloring of its large high centered blossoms which are produced continuously and profusely on vigorous, upright and much branched plants which reach a height of at least four feet.

3,669

GLADIOLUS PLANT

Ruth F. Melk, Mequon, Wis. 53092

Filed Nov. 17, 1972, Ser. No. 307,546

Int. Cl. A01h 5/00

U.S. Cl. Plt.—85 1 Claim

1. A new and distinct variety of gladiolus plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its unique color, which is predominantly rose but with a silver border, and its early blooming habit.

PATENTS

GRANTED DECEMBER 17, 1974

ERRATA

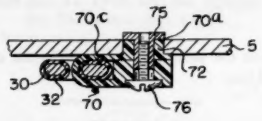
For CLASS	See PATENT NO.
023–267	3,854,176
034–077	3,854,224
028–072	3,854,313
081–377	3,854,354
242–086	3,854,509
350–160	3,854,751
425–008	3,854,850

PATENTS

GRANTED DECEMBER 17, 1974

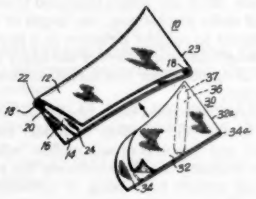
GENERAL AND MECHANICAL

3,854,146
FOOTBALL FACEMASK
Fred R. Dunning, 3800 Oakes Rd., Brecksville, Ohio 44141
Continuation-in-part of Ser. No. 316,126, Dec. 18, 1972,. This application May 4, 1973, Ser. No. 357,462
Int. Cl. A42b *3/00*
U.S. Cl. 2—9 **5 Claims**



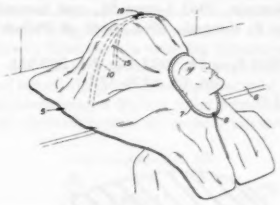
1. In a face mask and a helmet wherein the mask is an integral one-piece construction of a light metal core and a plastic coating covering said core, and wherein the mask comprises a plurality of arcuately curved bars which extend across the face opening of the helmet and which converge on each other at each end to form integral side portions and means for operable attachment of said side portions to the helment, and said mask having arm portions integrally connected with said side portions lying along the surface of the helmet overlying the forehead of the user thereof, and each arm portion terminating in a terminal, said terminals being spaced apart from each other on said helmet surface, fastening means fastening each terminal to the helmet comprising a bushing having a first part extending into the helmet and a second part extending into said terminal, an enlarged shoulder surrounding said bushing and located in between said first and second parts, fastener means disposed in said bushing and in pressure engagement with each said helmet and said terminal to resiliently bind the latter to said helmet.

3,854,147
SHIRT COLLAR CONSTRUCTION
Edward T. Duffy, Wyckoff, N.J., assignor to Manhattan Industries, Inc., New York, N.Y.
Filed June 6, 1973, Ser. No. 367,325
Int. Cl. A41b *3/06*
U.S. Cl. 2—132 **3 Claims**



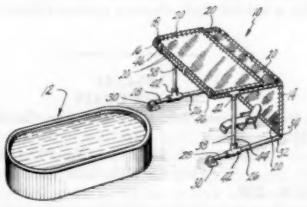
1. A shirt collar assembly comprising a multi-layered sandwich, the inner marginal inturned edges thereof being secured only along the bottom and side edges thereof by a line of stitches, said layers otherwise being free of securement, the stitch line being disposed out-of-sight inside the sandwich, a preformed stiffening patch within each collar wing comprising a second multi-layered sandwich, at least two layers of which are heat-fused together, and a third layer of which second sandwich is a relatively stiff, curl-preventing, thin, flat strip, the wing and lower edges of the fused layers of the patch coinciding in shape and length to the collar wing and disposed in offset relation to the coinciding wing and the lower edges of the collar, the patch being free of securement within the collar wing by the first referred to stitch line, and secured within the collar sandwich only by a second stitch line extending through all the layers of the collar sandwich and through all the layers of the stiffening patch at least along the coinciding lower and wing edges of the patch and collar sandwiches.

3,854,148
SHEET COVERING MEANS FOR HAIR COLORING, PERMANENT WAVING, AND HAIR CONDITIONING
Jasper Samuel La Rose, 491 Oxford Ave., Akron, Ohio 44310
Filed May 9, 1973, Ser. No. 358,659
Int. Cl. A47k *3/12;* **A61h** *35/00*
U.S. Cl. 4—159 **5 Claims**



1. A combination for the treatment of a head of human hair which comprises a basin and an impervious, flexible sheet, means for fastening one edge of the sheet around the face of a person leaning backward with his head in a substantially horizontal position, with the sheet extending over the hair, with means which is supported by the basin and supports the sheet over the hair and provides space between the hair and the tent and at least partially encloses the hair.

3,854,149
SUN CANOPY CONVERTIBLE TO A SWIMMING POOL COVER
Robert Mischke, Middletown, Conn.
Filed June 21, 1973, Ser. No. 372,326
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.11 **10 Claims**



1. A device convertible from a sun canopy mode to a swimming pool cover mode comprising:
a roof portion having a rearward edge;
a back portion having a top edge adjacent said rearward edge, said back portion being pivotally connected to said roof portion and having a lower portion;

base means including a forward end and rearward end said rearward end being pivotally connected to said lower portion;

support means attached to said roof portion at least when the device is in the sun canopy mode;

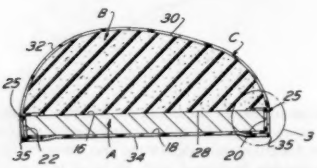
said forward end of said base means adapted to be pivotally secured to ground along a horizontal axis which is forward of said back portion when the device is in the sun canopy mode, said back portion being substantially vertical in the sun canopy mode and said roof portion extending forwardly therefrom and being supported at an angle with respect thereto by said support means when the device is in the sun canopy mode, said roof portion, back portion and base means adapted to pivot forwardly about said horizontal axis until said roof portion and said back portion are forward of said axis and are substantially horizontal for covering a swimming pool.

3,854,150

JOINT FOR CUSHIONED TOILET SEAT

Stanley J. Samuels, 2031 Locust St., and Samuel Samuels, 1801 John F. Kennedy Blvd., both of Philadelphia, Pa. 19103

Filed June 14, 1973, Ser. No. 369,911
Int. Cl. A47k *13/02*
U.S. Cl. 4—237 **3 Claims**



1. A cushioned toilet seat comprising a rigid generally annular base having interior and exterior peripheral edges, a plastic back-up strip of generally U-shaped configuration cemented to the interior and exterior peripheral edges of said base along the margins thereof, a resilient cushioning element of annular configuration overlying said base, and a plastic skin encapsulating said base and said cushioning element, said plastic skin including an upper facing and a sole sheet, each of annular configuration and having inside and outside marginal edges in overlapped disposition adjacent the interior and exterior marginal edges of said base, the inside and outside marginal edges of said facing and said sole sheet being pinch lapped and heat sealed together in combination with the adjacent back-up strip to define a welded three-element joint of trihedral configuration.

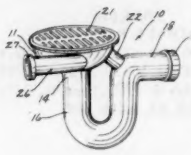
3,854,151

FLOOR DRAIN

Robert H. Boudewyn, 5035 S.W. 48th Ave., Des Moines, Iowa 50321

Filed Aug. 2, 1972, Ser. No. 277,154
Int. Cl. E03c *1/26*
U.S. Cl. 4—288 **4 Claims**

1. In a floor drain having a circular bowl portion, a strainer plate covering the bowl portion, a U-shaped trap conduit positioned below the bowl portion and fluidly connected at one end to the bowl portion at the extreme bottom of the bowl portion, and a main drain conduit connected to and leading from the other end of said U-shaped trap conduit, an improvement comprising a secondary inlet conduit connected to the bowl portion intermediate the top and bottom surfaces of the bowl portion, said secondary inlet conduit having a longitudinal axis and being connected to the bowl portion with the axis aligned substantially tangentially with respect to a circular segment of the circular bowl to thereby provide a swirling of



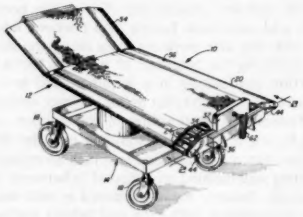
the fluid from the secondary inlet within the circular bowl through said trap.

3,854,152

APPARATUS FOR TRANSFERRING PATIENTS

David A. Chez, Phoenix, Ariz., assignor to Harold A. Ziskin, Phoenix, Ariz.

Filed Apr. 2, 1973, Ser. No. 346,839
Int. Cl. A47b *83/04;* **A61g** *1/02*
U.S. Cl. 5—81 R **5 Claims**



1. A self contained patient transferring device for attachment to a transfer cart having a height-adjustable, horizontal platform sufficient to hold a patient and wheels for ease of moving the transfer cart from place to place, said patient transferring device comprising:

a pair of slider mechanisms;

a plurality of parallel disposed rollers outlining an upper track and a plurality of parallel disposed rollers outlining a lower track, all of said rollers journaled to and between said pair of slider mechanisms, the length of said rollers being sufficient to support a patient in a prone position along his length and the rollers of the upper track being displaced along the slider mechanism sufficient to support his width;

a pair of superposed endless belts, one of said endless belts stretched around the plurality of rollers outlining the upper track and a second of said endless belts stretched around the plurality of rollers outlining the lower track, both of said endless belts being of sufficient width to cover the rollers;

said pair of slider mechanisms, the pairs of parallel disposed rollers and the pairs of superposed endless belts forming a rectangular frame member having a top and bottom and ends;

a common drive means mounted on said frame member connected to said plurality of rollers outlining the upper track and said plurality of rollers outlining the lower track to selectively rotate the upper and lower tracks, said lower track rotating to drive both tracks to and from an extended position via said slider mechanism and said upper tracks rotating to place and remove the patient from the patient transferring device,

a plurality of universal joining means, one for each of the plurality of rollers of both tracks and all located in the

same vertical plane thereby forming two sections of the upper and lower tracks; and

means to raise and support one section of the upper and lower tracks while keeping the second section in the horizontal position.

3,854,153

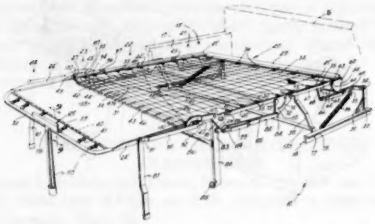
SOFA-SLEEPER

Leonard L. Fadler, Carthage, and C. Robert Findley, Joplin, both of Mo., assignors to Leggett & Platt Incorporated, Carthage, Mo.

Filed Jan. 12, 1973, Ser. No. 323,231

Int. Cl. A47c *17/40, 17/14*

U.S. Cl. 5—13 **11 Claims**



1. A foldable sofa bed fixture adapted to be mounted upon a stationary sofa frame, said fixture comprising a plurality of pivotally interconnected head, body, intermediate and foot bed frame sections, said frame sections each including a pair of opposed side rails, said frame sections being extendable to form a bed and foldable to form a sofa seat, longitudinally and laterally stretched wire fabric means carried by at least said head, body, and intermediate bed frame sections,

and

the improvement which comprises crossed wires attached at their opposite ends to the side rails of said body section of said frame, said crossed wires being located beneath and partially supporting said fabric means of said body section of said frame, said crossed wires being in tension and attached to the four corners of said body section of said frame, and

said body section of said frame being rigidified by at least two laterally extending cross rails bent downwardly out of the plane of said body section of said frame.

3,854,154

UNDER MATTRESS FOR RECLINING FURNITURE

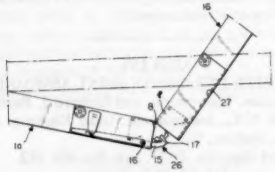
Felix Degen, Binningen, Switzerland, assignor to Inpaver AG, Zug, Switzerland

Filed Nov. 14, 1973, Ser. No. 415,556

Claims priority, application Switzerland, Nov. 15, 1972, 16643/72

Int. Cl. A61g *7/06;* **A41c** *19/00*

U.S. Cl. 5—202 **7 Claims**



1. In an under mattress for reclining furniture having a frame which is pivotally mounted in side portions of the reclining furniture and is subdivided into at least two sections which are relatively pivotable about an axis transverse to the longitudinal axis of the reclining furniture, the angular position of the two sections being lockable by a stop means operable by a person resting on the under mattress in a substantially horizontal stop position and at least one other stop position, the improvement wherein: said stop means comprises locking devices provided on each side of said frame at the ends of each section thereof adjacent to said pivoting axis, each device comprising a plurality of parallel spaced-apart arresting plates forming an assembly rigidly attached to its associated section of said frame, edges of said plates in each assembly being formed with a plurality of relatively aligned recesses, with leading portions of the corresponding assemblies of the two locking devices attached to the adjoining sections of said frame interdigitating on each side of said frame, whereby the assemblies forming each pair of interdigitated assemblies are relatively turnable when the two sections of said frame are relatively tilted, there being provided adjacent to the recessed edges of at least one pair of interdigitated assemblies a locking pawl which is manually tiltable about a pivot and having a locking tooth which points towards the recesses in said arresting plates, said pawl being resiliently urged into locking engagement with said recesses, the end of said pawl remote from its locking tooth being attached to a member which is adapted to be frictionally retained by a retaining element on a longitudinal side member of said frame to thereby maintain said locking pawl out of engagement with said recesses, said retaining element comprising a friction roller provided with a peripheral slot which narrows in the radially inward direction.

3,854,155

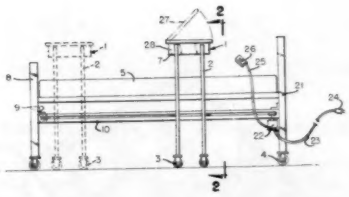
MULTI-PURPOSE BED TABLE MOVABLE BED'S LENGTH UNDER PATIENT'S CONTROL

Alice M. Picard, 8601 Harding Ave., Miami Springs, Fla. 33144

Filed Jan. 3, 1974, Ser. No. 430,547

Int. Cl. A47b *23/00*

U.S. Cl. 5—332 **5 Claims**

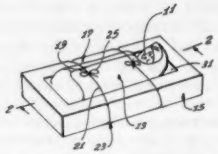


1. The combination of a bed and a table positioned over the bed but not resting thereon, which table has spaced legs positioned on each side of the bed, the bed having a side rail with channel therein substantially the entire length thereof, the said legs being attached to the said table at their upper extremity, and at their lower end provided with rollers to contact and move upon the floor, a flexible cable which is attached at approximately the mid-height of the legs to legs of the table, pulleys fastened to the respective ends of the bed contiguous the channel in the side rail, the cable movable within the side rail and contacting the pulleys in the length-wise channel in the side rail, means for activating the cable in opposite directions, whereby a person lying in the bed can cause the table to move in the direction of the length of the bed up and down at will.

3,854,156
PORTABLE BABY WARMING APPARATUS

Vernon L. Williams, Dana Point, Calif., assignor to Kay Laboratories, Inc., San Diego, Calif.

Filed Mar. 20, 1972, Ser. No. 236,120
Int. Cl. A61f *7/00, 7/06;* **F75d** *3/08*
U.S. Cl. 5—347 **25 Claims**



1. In combination for maintaining an infant at a substantially constant temperature:

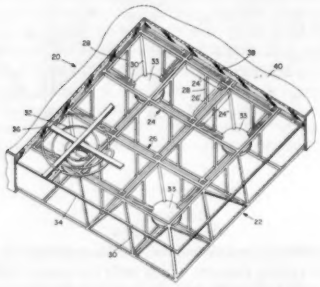
a portable mattress made from an insulating material;

first means disposed upon the mattress and having characteristics for chemically reacting to provide a substantially constant temperature for an extended period of time; and second means disposed upon the first means for swaddling the infant and for permitting the transfer of heat from the first means to the infant at the substantially constant temperature and for facilitating the maintenance of the infant at the substantially constant temperature.

3,854,157
UNITARY SPACE FRAME

David C. Trimble, Yorklyn, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 25, 1973, Ser. No. 382,625
Int. Cl. A47c *23/04, 25/00*
U.S. Cl. 5—351 **5 Claims**



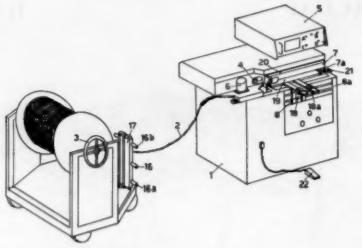
1. A unitary space frame suitable for forming in a simple two-piece mold having a direction of mold opening travel, comprising:

an upper and a lower grid composed of grid members, said upper grid being offset from said lower grid in plan; and a plurality of first connecting members each interconnecting a grid member in said upper grid and a grid member in said lower grid that are angularly askew, said first connecting members being oriented parallel to the direction of mold opening travel.

3,854,158
APPARATUS FOR BINDING LOOSE PERFORATED SHEETS FOR ALBUMS, COPY-BOOKS, CALENDARS AND THE LIKE

Daniele Pesenti Pigna, Bergamo, and Antonio Camozzi, Alzano Lombardo, all of Italy, assignors to Cartiere Paolo Pigna, S.p.A., Alzano Lombardo, Italy

Filed May 21, 1973, Ser. No. 362,059
Claims priority, application Italy, May 26, 1972, 24914/72
Int. Cl. B42c *5/12*
U.S. Cl. 11—1 A **11 Claims**



1. A semi-automatic apparatus for binding loose sheets perforated along one edge, comprising:

a feed reel for storing a wire band configured as a series "C-shaped" loops;

feed means for feeding said wire band from said feed reel along a predetermined feed path;

counter means for counting the number of loops of said wire band which are fed from said feed reel;

actuable cutter means for cutting the fed wire band into binder segments;

selector means for permitting manual selection of the number of said loops to be included in a binder segment;

comparator means arranged to compare the counted number at said counter means and the selected number at said selector means, and to terminate feeding by said feed means and actuate said cutter means when the two numbers are equal;

means for resetting said counter means when said cutter means is actuated;

a coupling station located along said feed path including means for receiving a stack of said loose perforated sheets when manually inserted into said station transversely of said feed path such that the perforated edges of said sheets enter said "C-shaped" loops;

actuable press means for closing the "C-shaped" loops at said coupling station about the perforated edges of the sheets in said stack; and

control means responsive to absence of predetermined positioning of said sheets at said coupling station for inhibiting operation of said press means, and responsive to removal of a stack of sheets from said predetermined positioning at said coupling station for re-initiating wire band feed by said feed means.

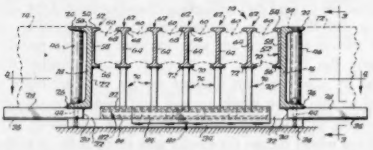
3,854,159
COMPOSITE EXPANSION JOINT ASSEMBLY

Ronald L. McLean, Tonawanda, and Richard J. Bartula, Buffalo, both of N.Y., assignors to Acme Highway Products Corporation, Buffalo, N.Y.

Filed Sept. 24, 1973, Ser. No. 400,182
Int. Cl. E01c *11/00*
U.S. Cl. 14—16 **12 Claims**

1. A composite expansion joint assembly comprising: edge members adapted to define the opposite sides of an expansion groove between deck sections; a plurality of longitudinally spaced bearing plates defining the bottom of said groove and

projecting outwardly of said edge members; opposed plates rigidly secured to the lower ends of said edge members and supported on said bearing plates for sliding movement relative thereto adjacent at least one end thereof; a plurality of resiliently yieldable elongated sealing elements in side-by-side



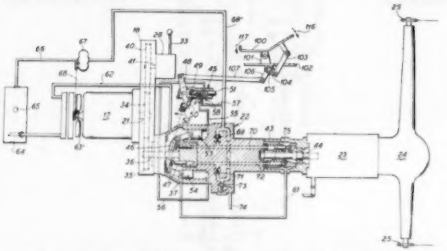
relation between said edge members; an elongated rigid structural member interposed between each pair of adjacent sealing elements; and support members rigidly secured to the lower ends of said structural members at spaced intervals therealong and supported on said bearing plates for sliding movement relative thereto.

3,854,160

STREET SWEEPER WITH A HYDROSTATIC TRANSMISSION

Donald L. Hildebrand, Union; Ernest F. Prescott, and Donald G. Kirk, both of Elgin, all of Ill., assignors to Elgin Sweeper Company, Elgin, Ill.

Filed Sept. 25, 1973, Ser. No. 400,703
Int. Cl. E01h *1/04*
U.S. Cl. 15—84 **19 Claims**



1. In a self-propelled street sweeper having sweeping means including a rotatable broom and conveyor means for depositing material dislodged by the broom into a hopper, said sweeper having a single engine with a crank shaft connected by a power splitting mechanism to a differential and sprockets of a chain drive for driving each of the driven wheels, a pair of wheels of the sweeper for propelling the sweeper and to drive means for actuating the sweeping means, the improvements comprising the drive train including a hydrostatic transmission comprising a hydrostatic motor in fluid communication with a variable displacement pump which transmission includes means for controlling the volume and direction of the displacement of the pump to control the speed and direction of movement of the street sweeper, said hydrostatic transmission driving through the differential and the sprockets of the chain drive for driving each of the driven wheels, and linkage means extending from an operator position on the sweeper and connected to the control means so that the speed and direction of the movement of the street sweeper can be controlled independently of the speed of the sweeping means.

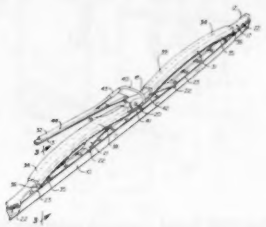
3,854,161

WINDSHIELD WASHER

Robert D. Benson, 2521 Cedar Ave., White Bear Lake, Minn. 55110

Filed Sept. 6, 1973, Ser. No. 394,569
Int. Cl. B60s *1/48*
U.S. Cl. 15—250.04 **14 Claims**

1. A windshield washer structure for adhesive attachment in a substantially parallel contiguous relationship to a wiper blade supporting assembly for oscillation with said assembly during cleaning of a windshield, said structure comprising an elongated flexible strip portion and an elongated tubular portion fixed along one longitudinal edge of said strip portion, said strip portion being characterized as a flange-like member extending laterally from said tubular portion, said flange-like strip portion being adapted to nest snugly in adhesive attachment lengthwise upon a wiper blade supporting assembly to cause said tubular portion to be in a substantially parallel and



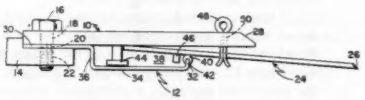
laterally juxtaposed relationship to the wiper blade supported by said assembly, and said tubular portion having a plurality of apertures therein located relatively on the ventral side thereof opposing a windshield as said washer structure is affixed as aforesaid upon a wiper blade supporting assembly, whereby in operation said apertures are adapted to direct washing fluid as fed to said tubular portion toward the windshield at a position adjacent the wiper blade during oscillation of the supporting assembly.

3,854,162

DOCTOR BLADE HOLDER

Robert H. Russell, Norfolk, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed Mar. 2, 1973, Ser. No. 337,437
Int. Cl. B41f *9/10*; **D21g** *3/00*
U.S. Cl. 15—256.51 **5 Claims**



1. A holder for a doctor blade for doctoring rolls and the like comprising:

a pair of holder members constructed and arranged to be secured together to a support adjacent one of their longitudinal edges with their opposite edges free for receiving and retaining the back portion of a doctor blade between them with its doctoring edge projected beyond them and with one member resiliently urged toward the other member to exert sufficient pressure on said blade to hold it in operative position against the other member;

said one member being formed of resilient metal and being arranged to be fastened to the other said member adjacent their edges remote from the doctoring edge of a said blade received between them so that the other edge of said one member is flexible toward and away from the other said member;

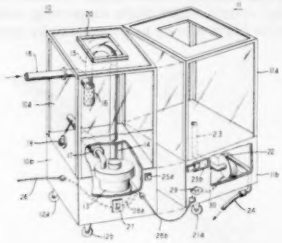
said one member having mounted thereon adjacent said other edge thereof a resilient, yieldable strip material extending longitudinally of said member and blade and positioned so that said one member exerts said pressure on said blade through said material, said material being deformable under said pressure;

and means to secure said holder members to a said support with said other member preceding said one member in the direction of rotation of the surface to be doctored.

3,854,163
LIQUID-VACUUM GENERATOR FOR USE WITH TWO CHAMBER CLEANING NOZZLE

James King Evans, 2601 Kutztown Rd., Reading, Pa. 19605

Filed Sept. 12, 1973, Ser. No. 396,501
Int. Cl. A47l 7/00
U.S. Cl. 15—321 **2 Claims**



1. A two tank liquid - vacuum generator for use with a two chamber cleaning nozzle comprising:

a first vacuum unit comprising;

a first housing,

vacuum means having an intake and an outlet, mounted within the first housing,

a vacuum tank mounted on the first housing,

a standpipe extending upwardly from the bottom of the vacuum tank,

a vacuum line communicating the intake side of the vacuum means with the lower end of the standpipe,

a vacuum inlet having one end thereof extending inwardly through the side of the vacuum tank near the top of the vacuum tank in the vicinity of the top of the standpipe, and the other end thereof formed for releasable connection to the cleaning nozzle,

a float valve attached to the top of the standpipe,

A second liquid unit comprising;

a second housing,

a liquid pump having an intake and an outlet, mounted within the second housing,

a liquid tank mounted on the second housing,

a liquid supply line extending from the bottom of the liquid tank to the intake side of the liquid pump, and

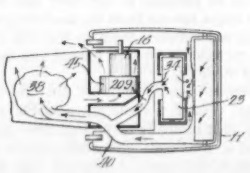
a liquid tube having one end thereof communicating with the pump and the other end thereof formed for releasable connection to the cleaning nozzle, and

means for releasably joining the vacuum unit and liquid unit to form the generator.

3,854,164
SELF-PROPELLED UPRIGHT VACUUM CLEANER

Joseph F. Schmitz, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 15, 1973, Ser. No. 323,779
Int. Cl. A47l 9/00
U.S. Cl. 15—340 **16 Claims**

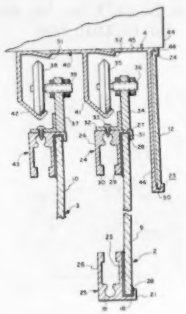


1. In a vacuum cleaner having means forming a dirt collecting chamber, a selectively positionable handle attached to said means forming a dirt collecting chamber for controlling movement of the vacuum cleaner selectively forwardly and rearwardly over a surface to be vacuum cleaned, an air conducting nozzle in communication with said dirt collecting chamber, and air moving means including first motor means for moving air through said nozzle to become dirt laden and moving said dirt laden air to said dirt collecting chamber means for removing the dirt therefrom, propelling means comprising: drive wheel means mounted on said vacuum cleaner nozzle for engaging the surface to be cleaned; second motor means carried by said vacuum cleaner nozzle and drivingly connected to said drive wheel means; and means for selectively controlling said second motor means for reversibly driving said drive wheel means forwardly and rearwardly in response to selective positioning of said handle, said air moving means including means for conducting cooling air other than the dirt laden air in heat transfer association with said second motor means for cooling said second motor means.

3,854,165
PANEL DOOR ASSEMBLY

James C. Haley, Tucson, Ariz., assignor to Arizona Glass and Mirror Co., Inc., Tucson, Ariz.

Filed May 14, 1973, Ser. No. 359,796
Int. Cl. A47h 1/04
U.S. Cl. 16—96 R **3 Claims**



1. A panel door structure for supporting a sliding panel within a post and lintel door opening, said structure being hidden from view such that it does not set off the decor of said panel, said structure comprising in combination:

a. a pair of horizontal rails forming the top and bottom sides of said framework, each of said horizontal rails including a load bearing structural section and an inwardly directed asymmetric channel for receiving a horizontal edge of said panel, each said horizontal rail being formed as a unitary single element structure wherein said load bearing structural section includes a first and second leg in lateral spaced relation to one another and extending from a common first base coincident with the respective edge of said panel to define an inwardly directed horizontal channel, and wherein said asymmetric channel includes said second leg, a center section extending from said common base and a lip for retaining said panel, whereby each of said vertical rails extend lateral to said panel by an amount equivalent to the thickness of said common first base;

b. a pair of vertical rails forming opposite vertical sides of said framework, each of said vertical rails including a further load bearing structural section adjacent the rear surface of said panel and a strip extending from said further structural section adjacent the respective vertical side of said panel without impinging upon the front surface of said panel, each said vertical rail being formed as a unitary single element structure wherein said further

load bearing structural section includes a third and fourth leg in spaced relation to one another and extending from a common second base to define an inwardly directed vertical channel, said strip extending from said second base in the plane of said second base, whereby each of said vertical rails extend lateral to said panel by an amount equivalent to the width of said strip;

c. a track depending from and extending along the full length of the lintel of the door opening; and

d. support means for suspending said framework from said track, said support means being the sole support for said structure within the door opening; whereby, said door panels are structurally braced and supported by said load bearing structural sections of said horizontal and vertical rails located at the rear surface of said panel and do not set off or intrude upon the decor of the front surface of said panel.

3,854,166

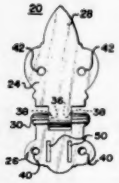
CAST HINGE

Karl Hannes, White Plains, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 187,427, Oct. 7, 1971, Pat. No. 3,742,555. This application May 30, 1973, Ser. No. 365,269The portion of the term of this patent subsequent to July 30, 1990, has been disclaimed.

Int. Cl. E05d *1/06*

U.S. Cl. 16—171 **8 Claims**



1. An article having a first element, first and second parallel extensions depending from an edge of said first element, first and second bearing means on said first and second extensions, the bearing means being aligned and directed toward each other,

a second cast element, extension means depending from an edge of said second cast element, third and fourth aligned bearing means on said extension means and being directed away from each other, and engaging said first and second bearing means respectively to form an articulated joint,

the respective bearing means being sufficiently overlapped to prevent non-destructive assembly and disassembly of said first and second elements,

said first element having a compressed region between said first and second extensions in which the material of the first element is distorted in a direction tending to separate said first and second extensions.

3,854,167

VEHICLE DOOR HINGE

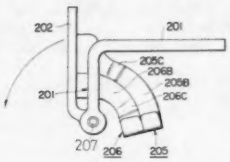
Riyouichi Fukumoto, Nagoya; Kenichi Fukura, Chiryu, and Mizuo Nyunoya, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha (Aisin Seiki Co., Ltd.), Kariya City, Aichi Pref., Japan

Filed Mar. 2, 1973, Ser. No. 337,399

Claims priority, application Japan, Mar. 2, 1972, 47-26146; Mar. 2, 1972, 47-26147

Int. Cl. E05f *1/12*

U.S. Cl. 16—184 **10 Claims**



1. An automotive vehicle door hinge having first and second hinge units, each hinge unit comprising, in combination, a first hinge element for fixed attachment to a vehicle body, a second hinge element for fixed attachment to a vehicle door, a hinge pin pivotally interconnecting said first and second hinge elements with each other, a spring element of channel confirugation having a base portion for fixed attachment to one of said hinge elements and a pair of resilient arms, each resilient arm being provided with an outwardly projecting convex projection for executing frictional sliding engagement with part of one of said hinge elements, each pair of projections provided on the resilient arms of the spring elements of said first and second units being respectively located differently in two phases for engaging with the part of said other hinge elements in two phases differing in time when the door is being opened or closed so that the door is kept in its half-open or closed position.

3,854,168

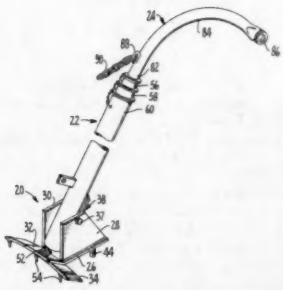
SKINNING TREE

Orval C. Bradley, 19 Sunset, Willows, Calif. 95988

Filed June 26, 1972, Ser. No. 266,463

Int. Cl. A22b *5/06*

U.S. Cl. 17—44.2 **6 Claims**



1. A portable skinning tree for suspending large game animals comprising:

a. a base including a mounting plate having a slot therein and a tree-engaging plate detachably mounted on the mounting plate, said tree engaging plate including an upstanding tab insertable into the slot in the mounting

plate, said tab having a hole therein through which a cotter pin may be inserted to retain the tab in the slot and wherein the tree engaging plate has at least one spike provided thereon for engaging a tree trunk,

b. a telescoping boom pivotally connected to the base, and

c. an arch member extending from the distal end of the telescoping boom.

3,854,169

MEANS FOR MOUNTING FALLERS IN A TEXTILE GILL BOX

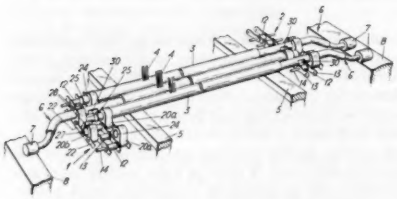
John K. P. Mackie, Belfast, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Nov. 6, 1972, Ser. No. 303,922

Claims priority, application Great Britain, Nov. 18, 1971, 53630/71

Int. Cl. D01g *19/10*

U.S. Cl. 19—127 **7 Claims**



1. Means for mounting fallers in a textile gill box including: chain means comprising a plurality of links and a plurality of pins connecting said links to form said chain means,

a plurality of housings secured to said chain means in a succession along the length thereof but individually separable therefrom, said housings having recesses therein for the reception of the ends of fallers, which recesses extend for a predetermined distance transverse to the length of the chain means,

said pins being located in openings in said links distinct from the recesses in said housings, and

each housing being spaced in said transverse direction from the housing next in said succession by a distance at least equal to said predetermined distance.

3,854,170

COTTON LINT CLEANER

James Daniel Caughlin, La Jolla, Calif., assignor to Ginners Incorporated, Monroe, La.

Filed Aug. 17, 1973, Ser. No. 389,384

Int. Cl. D01b *3/00*

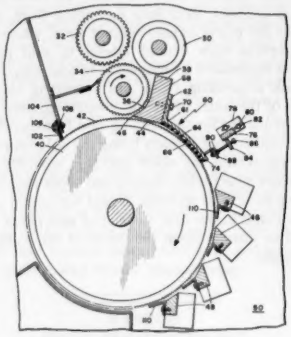
U.S. Cl. 19—202 **7 Claims**

1. In a cotton lint cleaning machine having means for forming lint into a continuous bat of cotton, a rotatable toothed saw cylinder on which the cotton bat is held and spun to eject trash therefrom, and feed means including a feed bar adjacent the cylinder for applying the bat to the teeth of the cylinder, the improvement comprising:

an extension plate secured to the feed bar and extending therefrom in the direction of rotation of the cylinder and across substantially the entire length thereof, said extension plate conforming arcuately to the periphery of the cylinder and having a trailing edge portion remote from the feed bar;

the cylinder confronting face of said extension plate being of a non-sparking material;

and means for adjusting at least the trailing edge portion of



said extension plate substantially radially relative to the cylinder.

3,854,171

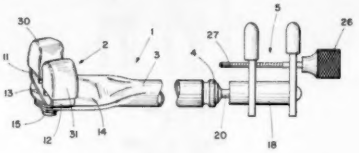
STEERING WHEEL HOLDER

Edward D. Wilkerson, P.O. Box 755 S. Court, Morristown, N.J. 08739

Filed Aug. 29, 1973, Ser. No. 392,653

Int. Cl. A44b *21/00*; **B62d** *1/16*

U.S. Cl. 24—81 A **4 Claims**



1. In a removable steering wheel holder for anchoring a vehicle steering wheel in a desired position relative the vehicle and which holder has an elongated body supporting a steering wheel clamp and a vehicle clamp, the improvement comprising a universal coupling connected to the elongated body to support the vehicle clamp with the vehicle clamp being pivotable relative the elongated body in both of two perpendicular planes with a full circle of vehicle clamp attitudes, and in which the universal coupling includes an angle link and a vehicle clamp shaft with the angle link having two legs one of which is pivotable in a first plane relative the elongated body and the other leg supports the vehicle clamp shaft so the clamp is rotatable in a full circle of rotation relative the second leg in a plane perpendicular to the first plane.

3,854,172

CLAMP ASSEMBLY FOR STEEL CORE ALUMINUM STRANDED WIRES

Hiroshi Noda, Tokyo, Japan, assignor to Sanwa Tetsuki Kougiyou Kabushiki Kaisha, Tokyo, Japan

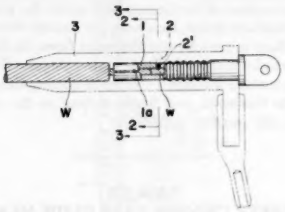
Filed Nov. 10, 1972, Ser. No. 305,508

Int. Cl. F16g *11/02*, *11/06*

U.S. Cl. 24—122.3 **1 Claim**

1. A compressable clamp assembly for steel core aluminum stranded wires comprising a steel sleeve having an axial bore and provided with a plurality of axial slits through the outer wall and communicating with the bore partially along the length thereof for permitting the sleeve to be radially compressed; a steel core wire inserted in the bore; a through screw hole directed to the axis of the sleeve near the base of the slits,

a machine screw driven radially into the screw hole into locked engagement at an inner end with the screw being hidden beneath the outer periphery of the steel sleeve wall; and a cylindrical aluminum sleeve telescoped over the steel



sleeve and hidden screw and deformably compressed onto the outer periphery of and comprising the steel sleeve at the axial slots onto the steel core wire and maintaining the screw in locked engagement with the core wire.

3,854,173

TURNBUCKLE RETAINER

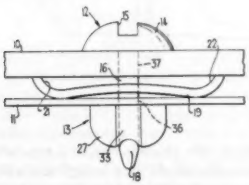
Barry Roger Michael Barnett, 41 Blackthorn Ave., West Drayton, England

Filed Feb. 12, 1973, Ser. No. 331,455

Claims priority, application Great Britain, Feb. 18, 1972, 7665/72

Int. Cl. A44b *17/00*

U.S. Cl. 24—221 R **4 Claims**



1. A fastener combination for securing two apertured panels together comprising a turnbuckle and a bush, the turnbuckle including a head and a shank extending integrally from the head and having transversely extending locking lugs at its leading end, the bush including a shank adapted to extend through the aperture in one of the panels so as to be nonrotatable therein, a head integral with the shank and adapted to abut one surface of said one panel, retaining means on the shank adapted to engage the other surface of said one panel to retain the bush in the aperture, and an elongate bore extending through the head and through the length of the shank whereby the turnbuckle shank can be passed through the head of the bush and into the shank of the bush and rotated through 90° to engage the locking lugs across the end of the shank of the bush, the head of the bush being substantially resilient at a position remote from the shank of the bush and in the direction of the length of said shank so as to be compressible in a direction towards the shank to accommodate a substantial tolerance in the length of the turnbuckle shank.

3,854,174

SLIDING CLASP FASTENER

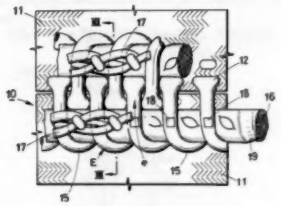
Tadahiro Yoshida, Fujisawa, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1972, Ser. No. 294,323

Claims priority, application Japan, Oct. 2, 1971, 46-90376

Int. Cl. A44b *19/12*

U.S. Cl. 24—205.1 C **3 Claims**



1. In a sliding clasp fastener having a pair of opposed stringer tapes and rows of coupling elements mounted on respective stringer tapes, said coupling elements being formed as parts on a continuous filament helical coil, each element having a coupling head, upper and lower arm portions and a base portion, the improvement which comprises a reinforcing cord extending longitudinally through the coil defining each row of coupling elements, said reinforcing cord having a helical groove disposed for engagement with the coupling elements coil to embed portions thereof in said groove to maintain a pitch spacing among the coupling elements equivalent to the helical pitch of said groove.

3,854,175

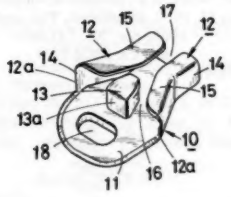
SLIDER FOR CONCEALED ZIP FASTENERS

Kyumatsu Yoshida, Uosu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1972, Ser. No. 294,437

Int. Cl. A44b *19/26*

U.S. Cl. 24—205.1 R **4 Claims**



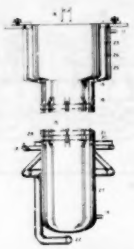
1. A slider for concealed zip fasteners which comprises a base, a pair of side flanges extending from opposite longitudinal edges of said base and having upright sidewalls and horizontal top walls integral therewith and lying substantially parallel with the plane of said base, and a guide post situated centrally between said side flanges and extending upright to a point substantially flush with the top walls of said flanges, said guide post defining with said flanges a Y-shaped guide channel for passing a zip fastener, said base having an aperture formed forwardly of said guide post for receiving in laterally surrounding relation a pin-like object with which to move the slider in any selected one of two opposite directions, said pin-like object being normally removed when not moving the slider.

3,854,176

HIGH CAPACITY GEOMETRICALLY-FAVORABLE SOLVENT EXTRACTION COLUMNS FOR PROCESSING FISSILE MATERIALS

Jack B. Kendall, Williston, S.C., and James H. Nordahl, Richland, Wash., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Sept. 29, 1971, Ser. No. 184,709
Int. Cl. B01d *11/04*
U.S. Cl. 23—267 C 5 Claims



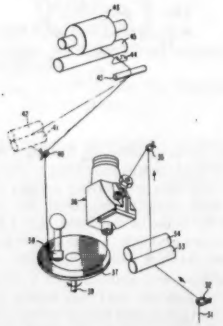
1. A pulsed solvent extraction column for processing fissile materials having a vertically disposed annular column processing section, a removable array of a plurality of plates spaced at intervals within said annular column processing section and an annular disengaging section, said annular column processing section being bounded by a removable internal cylinder and an external cylinder, said internal cylinder containing a liquid solution of a neutron absorbing or moderating material maintained at a higher hydrostatic pressure than the processing fluid in said annular column processing section whereby, in the event of leakage, the liquid solution of neutron absorbing or moderating material will flow into the annular processing section, thereby decreasing the possibility of displacement of the liquid in the internal cylinder by fissile solutions.

3,854,177

PROCESS AND APPARATUS FOR TEXTURING YARN

Alvin L. Breen, and Herbert G. Lauterbach, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 43,897, July 19, 1960, abandoned, which is a continuation-in-part of Ser. No. 698,103, Nov. 22, 1957, abandoned. This application Apr. 15, 1968, Ser. No. 721,403
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 10 Claims



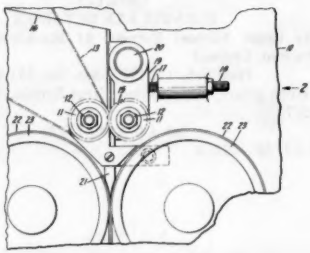
1. In a process for texturing multifilament yarn comprising thermoplastic synthetic linear polymer filaments with compressible fluid heated to a temperature which will plasticize the filaments to impart a persistent crimp having a random, three-dimensional, curvilinear, extensible configuration continuously along the filaments; the improvement which comprises jetting a high velocity stream of the heated fluid to form a turbulent plasticizing zone of heated fluid, feeding the filaments at a rate of at least 500 yards per minute into the turbulent zone, continuously forwarding and crimping the filaments by turbulent action of the heated fluid while the filaments are in a plasticized condition, receiving the treated filaments on a moving surface to remove the filaments from the heated fluid in a substantially tensionless state, conveying the filaments on the moving surface through a stream of cooling fluid to set the crimp in the filaments, and finally taking up the cooled filaments from the moving surface.

3,854,178

STUFFER CRIMPER YARN GUIDE MEANS

Ronald S. Schartel, Reading, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 25, 1973, Ser. No. 363,920
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.6 1 Claim



1. An improved yarn guide means of a type which receives multi-filament thermoplastic yarn being fed at a high rate from a source by a pair of cooperating feed members and discharging into a nip formed between a pair of rolls driving a pair of opposed cooperating belts which operate at a slower speed than said feed members and which define a texturizing zone where said yarn is held in a compacted condition while it is heated and subsequently cooled to effect texturizing, wherein the improvement comprises:

a tubular body having an axial opening therethrough;

said tubular body having a first end which includes a pair of extended tab portions adapted to closely receive said pair of cooperating feed members therebetween;

said tubular body having a second end which is tapered to closely extend into said nip; and

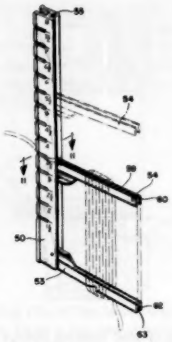
said axial opening being defined by a smooth, continuous inner wall of said tubular body in the form of a fustrum of a cone with its larger cross-sectional area adjacent said nip; whereby

said tabs and said taper of said second end of said tubular body insure that said yarn is retained within said axial opening as it is being compacted and the shape of said axial opening and the continuity of said inner wall permits unrestricted flow of said yarn in said compacted condition to said texturizing zone.

3,854,179
TASSEL AND POMPOM MAKING APPARATUS

Jonas Montoya, 400 E. Randolph, Chicago, Ill. 60601

Filed June 5, 1972, Ser. No. 259,543
Int. Cl. D04d 7/08, 7/06
U.S. Cl. 28—2 4 Claims



1. Apparatus for making a tassel or the like from a flexible string of material, said apparatus comprising:

a substantially flat U-shaped object having spaced first and second members projecting outwardly from a base member,

said first and second members each having inner and outer walls connected by an outboard wall,

said outboard and outer walls of said first and second members having retaining means located along at least a portion of their length for guiding and retaining a flexible string of material therein;

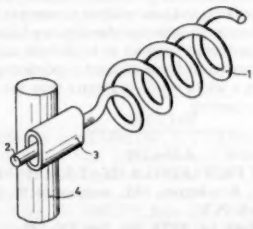
a string retaining notch disposed on at least one of said first and second members adjacent said retaining means; and,

means mounting one of said first and second members on said base member for adjusting the space between said first and second members, whereby a string of material may be guided and retained by said retaining means and said notch in the course of making a tassel or the like.

3,854,180
METHOD OF CONNECTING A FILAMENT TO A SUPPORT IN AN ELECTRIC FILAMENT LAMP

Leopold Stanislas Maria Pastijn, Deurne, and Ghislain Felix Alfons Arthur Verboven, Genk, both of Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 218,269, Jan. 17, 1972, abandoned. This application Sept. 12, 1973, Ser. No. 396,449
Claims priority, application Netherlands, Jan. 16, 1971, 7100606
Int. Cl. H01j 9/00
U.S. Cl. 29—25.15 1 Claim



1. A method of connecting a filament to a support in an electric filament lamp comprising the steps of:

inserting an end of the filament in a cylindrical sleeve;

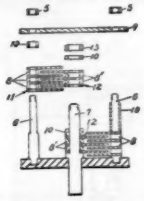
juxtaposing the sleeve containing said filament end transversely to and in contact with said support; and

simultaneously compressing said sleeve against said filament wire and support to deform said sleeve into a non-circular cross section and spot welding said compressed sleeve to said support and said filament to said sleeve.

3,854,181
METHOD OF PRODUCING VARIABLE CAPACITORS

Yoshio Matsuwake, and Yukihisa Fujishima, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1973, Ser. No. 346,828
Int. Cl. H01g 13/00
U.S. Cl. 29—25.41 2 Claims



1. A method of producing a variable capacitor comprising the steps of preparing selected numbers of highly conductive stator electrodes, highly conductive rotor electrodes, and spacers, each of said spacers having a core of a first highly conductive metal and an exterior coating of a second metal whose specific volume resistivity is larger than that of the highly conductive metal of its core, stacking alternately said stator electrodes and said spacers to form a first structure and said rotor electrodes and said spacers to form a second structure such that each stacked structure has the electrodes positioned on the outermost opposite ends, pressing each stacked structure and heating contacting zones between said spacers and said electrodes to melt the metal plated around each said spacer in each contacting zone and to cause adjacent electrodes and spacers to fusion-weld one to another through the molten plated metal, cooling said welded electrode structures, and, assembling the integrated rotor electrode structure to a rotor shaft and the integrated stator electrode structure to a capacitor stationary member to thereby produce a variable capacitor.

3,854,182
PROCESS FOR MANUFACTURING ELECTRICAL CONDENSERS

Herbert Forster, Grunbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 215,121, Jan. 3, 1972, abandoned. This application Dec. 26, 1973, Ser. No. 428,404
Claims priority, application Germany, Feb. 25, 1971, 2108988
Int. Cl. B32b 31/26
U.S. Cl. 29—25.42 6 Claims

1. In a process of producing a wound electrical condenser in the form of a coil formed of at least one paper layer impregnated with a dielectric impregnating medium and at least one layer composed of a synthetic resin that shrinks when heated and swells when brought into contact with the dielectric impregnating medium, which condenser is formed by first winding the paper and synthetic resin layers into a tightly wound coil and then impregnating the wound coil with a dielectric impregnating medium at a temperature at which the dielectric impregnating medium is liquid and tempering the said coil by heating at an elevated temperature and at atmospheric or a subatmospheric pressure, the improvement which comprises preliminarily impregnating the paper which is to be used in producing the condenser in the form of a loosely wound coil

with a molten dielectric impregnating medium that is solid at room temperature and thereafter assembling the thus-impregnated paper with the synthetic resin layer into a tightly wound coil and impregnating the same with the liquid dielectric impregnating medium and tempering the thus tightly wound impregnated coil by heating the same at an elevated temperature at atmospheric or a subatmospheric pressure.

3,854,183

TOOL HOLDER

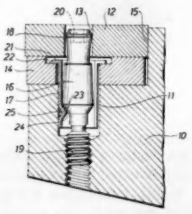
Axel Sven Olof Roos, Odengatan, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Jan. 28, 1974, Ser. No. 437,306

Claims priority, application Sweden, Feb. 21, 1973, 73023889

Int. Cl. B26d *1/00*

U.S. Cl. 29—96 **3 Claims**



1. Tool holder for clamping an apertured indexable insert (**12**) into an insert-receiving site in a holder body so that the insert rests on a bottom-supporting surface which is formed by a detachable shim plate (**14**), these being a clamping pin threadably received with loose engagement in a portion of bore (**11**) in the holder while received in the hole of the insert so as to secure the insert into clamping engagement with at least one lateral abutment (**15**) in said site, characterized in that the clamping pin (**16**) is at least partially surrounded by a sleeve member (**17**) arranged in the bore (**11**) for cooperation with said clamping pin, said sleeve member being provided with a radially extending collar (**21**) to abut against a support surface (**22**) on the shim plate (**14**), there being an inclined cam surface (**23**) provided on said sleeve member cooperating with a complementary shaped conical abutment surface (**24**) on said clamping pin, so that the clamping force exerted on said cam surface (**23**) when in-screwing the clamping pin causes a component parallel to the axis of the sleeve member that urges the sleeve member against the shim plate while a component directed inwardly against the tool holder body urges the clamping pin and the insert against said lateral abutment or abutments.

3,854,184

DEMOUNTABLE PRINTING CYLINDERS

Sidney Katz, Spring Valley, N.Y., assignor to Mosstype Corporation, Waldwick, N.J.

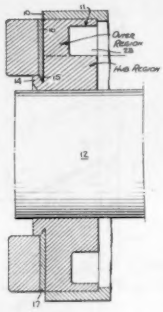
Filed Sept. 25, 1973, Ser. No. 400,685

Int. Cl. B21b *31/08*

U.S. Cl. 29—123 **8 Claims**

1. A demountable printing cylinder adapted to be shrunk fit by means of a flat annular heating element onto a mandrel formed of metal having a relatively low thermal coefficient of expansion; said cylinder comprising:

an open-ended tube, and end closures disposed at opposite ends of said tube, each closure having a collar-like formation defining annular front and rear faces, an inner region surrounding a central bore through which the mandrel is extended and an outer region whose periphery engages the associated end of said tube, said outer region being relieved in the rear face of the closure to reduce the mass thereof whereby thermal energy applied to said closure by means of said annular heating plate engaging substantially the entire front face thereof is transferred mainly to said inner region to expand said bore at a rapid rate, only



a minor portion of said heating energy being transferred by said relieved outer region to said tube, said closure being formed of a metal having a relatively high thermal coefficient of expansion.

3,854,185

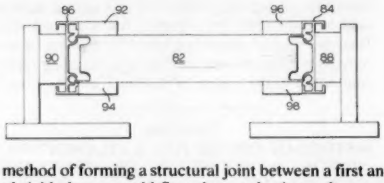
METHOD OF FORMING STRUCTURAL JOINTS

Robert John Reid, 50 Transwell Ave., Willowdale, Ontario, Canada

Filed July 9, 1973, Ser. No. 377,786

Int. Cl. B23p *17/00, 11/00*

U.S. Cl. 29—155 R **14 Claims**



1. A method of forming a structural joint between a first and a second rigid element, said first element having at least one flange extending from a face thereof and having an outer end, said second element having at least one elongate groove which is substantially arcuate in ross-section provided on a face thereof, each said groove having opposed edges which define an elongate opening of a dimension to permit entry of a flange into said groove, comprising the steps of:

placing the outer end of at least one flange into the elongate opening of said at least one groove; and

applying sufficient external force to at least one of said first and second elements to cause relative movement between said elements so as to decrease the distance between the opposing faces thereof and so as to deform said flange within said groove to form at least a portion of a coil therein having a width which is greater than the width of said elongate opening.

3,854,186

METHOD OF PREPARING A HEAT EXCHANGER

Francis J. Sergeys, Kensington, Md., assignor to W. R. Grace & Co., New York, N.Y.

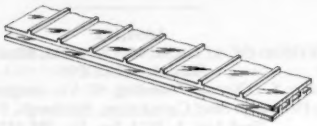
Filed June 14, 1973, Ser. No. 370,135

Int. Cl. B21d *53/02;* **B23p** *15/26*

U.S. Cl. 29—157.3 D **4 Claims**

1. A process for preparing a heat exchanger which comprises the steps of:

a. Preparing a mixture containing 30–85 percent of a ceramic powder, 5–20 percent of an olefinic polymer having a molecular weight of about 150,000 to 2,000,000, and 10–50 percent of a plasticizer,
b. compounding the mixture by heating to about 300°–555°F with working until a uniform composition results, extruding said composition as a flat sheet and embossing to form a series of ribs thereon,
c. Positioning one of the sheets on top of the other in a manner such that the ribs of the lower sheet contact the back of the upper sheet, and that the ribs are in 90° relationship to each other,



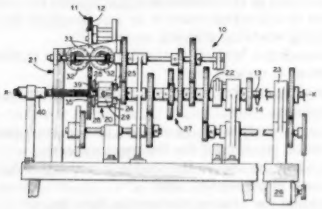
d. Heat-sealing the ribs of the lower sheet to the back of the upper sheet to form a layered structure,
e. Heating the surfaces of the layered structure to about 350°–500°F and winding the structure about a mandrel thus forming a bonded structure,
f. Cutting structures in the desired shape from said bonded structure and extracting the plasticizer therefrom,
g. Heating to about 240°–700°C to burn out the polyolefin and sintering to a temperature of 1,300°–1,400°C for about 2–6 hours,
h. Cooling and recovering the heat exchanger structure.

3,854,187

APPARATUS FOR MAKING BEADED BELTS

David Engelson, 67-70 Yellowstone Blvd., Forest Hills, N.Y. 11375

Filed July 30, 1973, Ser. No. 384,139
Int. Cl. B23p *19/04*
U.S. Cl. 29—208 D **10 Claims**



1. An apparatus for making beaded belts which comprises a first feed means operable to advance a length of belt stock helically along a given longitudinal path, and a second feed means operable to feed a string of beads to said belt stock for winding thereupon as said belt stock helically advances.

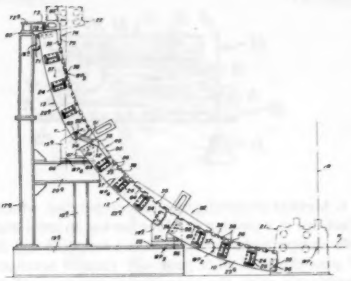
3,854,188

METHOD OF ASSEMBLING A CURVED ROLL-RACK

John J. Anderton; Max S. Dudzic, and Wilmer C. Wrhen, all of Oil City, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 265,379, June 22, 1972, abandoned. This application Dec. 19, 1973, Ser. No. 426,292
Int. Cl. B23q *17/00*
U.S. Cl. 29—407 **8 Claims**

1. A method of assembling a curved roll-rack in relation to surrounding structure comprising pivotally mounting a lower frame section at its exit end on a fixed body at the exit end of the rack, accurately positioning said lower frame section by aligning a predetermined accurately marked point thereon with a predetermined working point on the surrounding structure, roughly positioning a base member at the entry end of



said lower section, accurately positioning the base member with a gauge which engages reference pins on said lower section, and repeating the foregoing steps to position a middle section on said base member, another base member at the entry end of said middle section, and an upper section on said second-named base member.

3,854,189

METHOD OF MAKING A BONDED SILICON NITRIDE ARTICLE HAVING PORTIONS OF DIFFERENT DENSITY

Andre Ezis, Plymouth; Michael U. Goodyear, Grosse Ile, and Karsten H. Styhr, Farmington, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

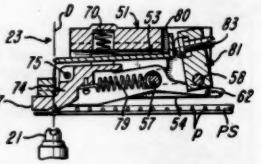
Filed Dec. 20, 1973, Ser. No. 426,834
Int. Cl. B22f *7/06*
U.S. Cl. 29—420 **6 Claims**

1. A method of making a duo density article of silicon nitride which comprises the steps of:
compacting a mixture consisting of from about 95 to 99.5 percent by weight silicon nitride particles and from about 5 to 0.5 percent by weight of a densification aid to at least 98 percent of theoretical density by use of heat and pressure thereby to form a first element of silicon nitride;
forming the general shape of a second element by a slip casting operation, said slip casting being accomplished from a slip containing silicon metal particles suspended in a vehicle;
sintering said second element in an inert atmosphere for a time and at a temperature sufficient to increase the strength of said second element, the inert atmosphere being formed of a gas which will not react with the silicon metal particles;
nitriding said second element in a nitriding operation so that said element is converted substantially to pure silicon nitride;
bringing a surface area of said first element into close association with a surface area of said second element;
holding said associated surfaces of said first and said second elements so they do not move with respect to one another; and
forming a bond between said associated surfaces of said first and said second elements by applying heat to both elements and pressure on one of said elements while the other of said elements is held thereby to force a portion of the silicon nitride forming said surface area of said one element into bonding relationship with said surface area of the other element.

3,854,190
PINNING METHOD AND APPARATUS

Robert William Stark, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Sept. 20, 1973, Ser. No. 399,026
Int. Cl. B23p *11/00;* **B25c** *5/16*
U.S. Cl. 29—432.1 **14 Claims**



1. Method of pinning tags to merchandise, which method is practiced in a pinning machine having an anvil and a cooperable plunger and adapted to have a supply of tags and a supply of pins disposed in a generally parallel arrangement on a flexible pin strip, the approximate pin-to-pin distance being equal to P, wherein compensation is made for the absence of pins from N number of successive pin positions in the pin strip, a tag and merchandise being adapted to be disposed at a pinning position between the cooperable anvil and plunger, and the pin strip being fed toward a pin receiving position in alignment with the pinning position by a movable claw, the claw being controlled by a control member which can ride on a pin during the forward movement of the claw until the claw has reached the leading pin in the pin strip, comprising the steps of:

feeding a tag to the pinning position;

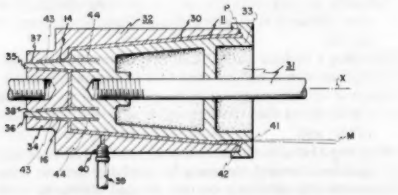
driving a pin at the pin receiving position through the tag and merchandise while the anvil and plunger are in cooperation;

and moving the claw in a pin strip feeding stroke through a distance of at least (N + 1)P but not less than **2P** while the control member prevents engagement of the claw with any pin but the leading pin in the pin strip until the claw is in position to engage the leading pin to feed the pin strip a distance equal to P in the event the leading pin is a distance P from the pin receiving position or through a distance equal to (N + 1)P in the event the leading pin in the pin strip is a distance (N + 1)P from the pin receiving position.

3,854,191
METHOD OF MAKING FLUID COLLECTION RECEPTACLES

Legrand K. Holbrook, Salt Lake City, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 98,566, Dec. 16, 1970, Pat. No. 3,738,381. This application May 25, 1973, Ser. No. 363,849
Int. Cl. B23p *11/02*
U.S. Cl. 29—453 **4 Claims**

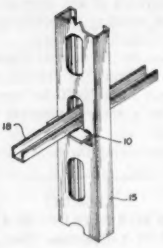


4. A method of making a container structure comprising a container and a base closure member engaging the former, said method comprising the steps of: molding a container, having an open end, in the manner of simultaneously molding through positive and negative molds a peripheral side wall, an upper closed end integral therewith, an exterior base snap bead, and plural, exteriorly extending, wholly-open port extensions integral with said upper closed end and communicating with the interior of said container, said peripheral side wall being assured of uniform wall thickness through such method step including mold-keying means passing through said port extensions for keying the mutual movement of said molds mutually together and apart; providing a closure base having an interior snap recess; and then fastening said closure base at said snap bead and recess in a liquid seal engagement with respect to said open end.

3,854,192
METHOD OF ATTACHING LATERAL BRACING TO METAL STUDDING

Theodore S. O'Konski, Wheeling, W. Va., assignor to Wheeling-Pittsburgh Steel Corporation, Pittsburgh, Pa.

Filed Aug. 3, 1973, Ser. No. 385,457
Int. Cl. B23k *31/02*
U.S. Cl. 29—470.5 **1 Claim**



1. A method of attachment of lateral bracing elements to metal studding of the perforated web type, comprising the steps of:

a. attaching in preliminary position against the web of a stud and in transverse relation to a perforation therein a clip having studding gripping means,

b. extending a bracing element through the perforation and resting it on said clip,

c. leveling the bracing element in a uniformly horizontal position,

d. manually adjusting the clip to a level corresponding to the leveled position of the bracing elements,

e. welding the clip to the studding in the position as determined in clause (d), and

f. welding the bracing element to the clip.

3,854,193
METHOD OF PRODUCING COPPER CLAD ALUMINUM WIRE

Tetsuo Yamaguchi; Teruyuki Takayama, and Masao Hiderita, all of Tokyo, Japan, assignors to The Fujikawa Cable Works Limited, Tokyo, Japan

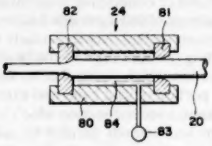
Filed Dec. 14, 1972, Ser. No. 314,912
Claims priority, application Japan, Dec. 27, 1971, 46-1255
Int. Cl. B21d *39/04*
U.S. Cl. 29—473.9 **5 Claims**

1. A method of producing a copper clad aluminum wire comprising

covering an aluminum core longitudinally with a copper strip in cylindrical form;

facing the resulting seam of said copper strip and welding said seam together in a shielded atmosphere comprising an inert gas at a pressure greater than atmospheric pres-

sure to form a copper clad aluminum wire, and



reducing the diameter of said copper clad aluminum wire through a die having a half-approach angle of from 35° to 55° at a temperature below 200°C.

3,854,194

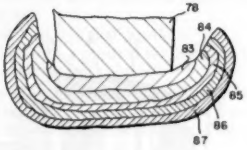
LIQUID INTERFACE DIFFUSION METHOD OF BONDING TITANIUM AND/OR TITANIUM ALLOY STRUCTURE AND PRODUCT USING NICKEL-COPPER, SILVER BRIDGING MATERIAL

James R. Woodward, El Cajon, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Continuation-in-part of Ser. No. 99,061, Dec. 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 765,156, Oct. 4, 1968, abandoned. This application Aug. 16, 1973, Ser. No. 388,739

Int. Cl. B23k *31/02, 35/38*

U.S. Cl. 29—494 **24 Claims**



1. The liquid interface diffusion method of bonding honeycomb core material to its facing sheets where said core and face sheets are made of titanium or titanium based alloy material which comprises the steps of:

depositing on the core edge surface sequentially as a laminate thereon layers of at least three metals to form a diffusion bridge material;

placing together the faying surfaces to be bonded with said bridge material therebetween;

subjecting said faying surfaces to sufficient positive pressure to maintain position and alignment for joining; and

while the faying surfaces are being so held in a protective atmosphere, raising the temperature of the same to first cause an atomic diffusion to take place within the laminate of said bridge material and between said bridge material and the titanium, secondly to cause a melt of the eutectic alloy formed by said diffusion, and thirdly to maintain the temperature at a predetermined level above said melt level for a predetermined period of time after the eutectic melt solidifies to thereby dilute said bridge material and titanium in the region of the bond by solid state diffusion therebetween, said three metals of the laminate being nickel, copper and silver, said nickel and copper layers of the laminate being equal and consisting of from 76 to 90 percent of the total weight of the laminate.

3,854,195

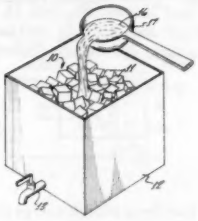
METHOD OF MAKING AN INTRICATE FREE-FORM CAST METAL ART OBJECT

Thomas W. Landig, 1136 Westmoreland Cir., Walnut Creek, Calif. 94596

Filed Dec. 3, 1973, Ser. No. 421,097

Int. Cl. B22d *23/08*

U.S. Cl. 29—527.5 **19 Claims**



1. A method of creating an unique three-dimensional metal art casting having a variety of protrusions and open spaces, which method comprises:

a. providing a bed consisting essentially of a multiplicity of pieces of ice,

b. causing molten metal of relatively low melting point to flow through intervening regions between the pieces of ice in said bed, and

c. simultaneously permitting said metal to solidify to thus form the unique metal art casting.

3,854,196

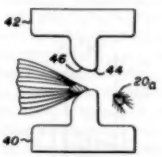
STACKED ELECTRODE CAPACITOR AND METHOD OF MAKING SAME

Noah S. Derrick, Lexington, and Jacob T. Zeigler, Cayce, both of S.C., assignors to General Electric Company, Owensboro, Ky.

Division of Ser. No. 246,069, April 20, 1972, Pat. No. 3,806,769. This application Sept. 24, 1973, Ser. No. 399,989

Int. Cl. B01j *17/00*

U.S. Cl. 29—570 **5 Claims**



1. A method of constructing a capacitor comprising:

a. assembling a stack of foil electrodes having dielectric spacers therebetween so that the edges of preselected electrodes extend beyond one side of the stack while the remainder of said electrodes extend from another side;

b. placing a terminal bar adjacent the foil edges protruding from one side of said stack; and

c. pressing the electrode foil edges and the bar together to cause the foil edges, and the foil edges and the bar to frictionally engage and to laterally move relative to each other with an abrasive action to remove oxides and other surface materials from the edges and the bar so that the pressure will cause the foil edges to weld to said bar and to each other.

3,854,197

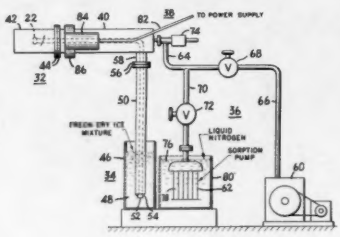
STABILIZATION OF RADIATION DETECTORS

Sanford Wagner, Knoxville, Tenn., assignor to Ortec, Incorporated, Oak Ridge, Tenn.

Filed Aug. 9, 1972, Ser. No. 279,176

Int. Cl. B01j *17/00*

U.S. Cl. 29—585 **6 Claims**



1. A method of stabilizing the full-energy peak efficiency of a semiconductor radiation detector comprising the steps of:

placing the detector in a substantial vacuum;

cooling the detector substantially to the temperature of dry ice;

applying a reverse bias to the detector during the cooling to generate a reverse leakage current in the detector;

maintaining the detector substantially at the temperature of dry ice and under reverse bias for a period of 2 to 8 hours until the reverse leakage current reaches a minimum value; and

further cooling the detector substantially to the temperature of liquid nitrogen.

3,854,198

SEMICONDUCTOR ARRANGEMENT AND METHOD OF PRODUCTION

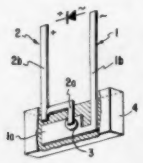
Winfried Schierz, Roth, Germany, assignor to Semikon Gesellschaft fur Gleichrichterbau und Elektronik m.b.H., Nurnberg, Germany

Continuation of Ser. No. 109,831, Jan. 26, 1971, abandoned, which is a division of Ser. No. 8,996, Feb. 5, 1970. This application July 2, 1973, Ser. No. 375,535

Claims priority, application Germany, Apr. 1, 1969, 1916554

Int. Cl. B01j *17/00*

U.S. Cl. 29—588 **8 Claims**



1. A method of manufacturing semiconductor arrangements wherein semiconductor diode wafers are arranged in a plane and contacted between portions of associated conductors comprising the steps of:

producing, from a band of planar conductive material, a plurality of periodically repeating planar geometrically patterned structures of conductors each of which is connected to a longitudinally extending portion of said band of conductive material which serves as a transport strip;

forming a plurality of clamp-type semiconductor wafer mountings within said structures by bending one of a pair of adjacent conductors so as to raise a portion thereof out of the plane of said structure and displace said portion parallel to said plane and laterally in a direction parallel to the longitudinally extending portion so that said portion substantially maintains its original orientation with respect to said band of conductive material and overlaps the other of said pair of adjacent conductors, where the overlapping portions extend perpendicularly to the longitudinally extending portion, each of the bent conductors having a first section which is attached to said longitudinally extending portion of said band and extends perpendicularly therefrom, a second section which is attached to said first section and extends parallel to said longitudinally extending portion, and a third section which is attached at the end of the second section and extends perpendicular thereto, said third section forming the overlapping portion;

inserting a semiconductor wafer with the proper electrical orientation between the overlapping conductors of each of said clamp-type mountings;

simultaneously processing all of said planar structures to provide a plurality of encapsulated semiconductor devices which are connected to said transport strip by means of portions of said conductors; and

separating each of said semiconductor devices from said transport strip.

3,854,199

MANUFACTURE OF MAGNETIC TRANSDUCING HEADS

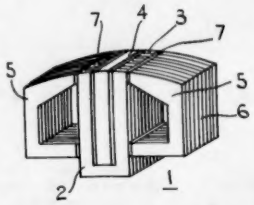
Peter Charles Ridgway, Staines, England, assignor to International Computers Limited, London, England

Filed Apr. 13, 1973, Ser. No. 350,981

Claims priority, application Great Britain, Apr. 15, 1972, 17477/72

Int. Cl. G11b *5/42*

U.S. Cl. 29—603 **3 Claims**



1. A method of manufacture of a magnetic transducing head including the steps of providing a first member; providing a plurality of magnetic laminations each with an aperture therein, the apertures being aligned on a common axis; assembling the laminations on to the first member, the first member passing through the apertures of all the laminations; bonding the laminations to one another and to the first member to form an aligned stack; forming two flat parallel surfaces on opposite edges of the stack; forming an assembly by bonding two magnetic laminar C-shaped members, each terminating in a pair of co-planar surfaces, one to each of said flat surfaces of the stack with said co-planar surfaces of each C-shaped member being spaced from the respective flat surface to which it is bonded, the first member lying between the-C-shaped members, the laminations of the stack and the laminations of the C-shaped members lying in parallel planes; removing material from the bonded assembly to form a face parallel to said common axis, the first member being at least partially exposed on the face so formed to produce a surface having two magnetic gaps respectively between the C-shaped members and the stack.

3,854,200
INTEGRATED CIRCUIT LEAD FRAME PACKAGE

Horace Pops, Fort Wayne, Ind., and Barry C. Johnson, Pittsburgh, PA, assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Mar. 5, 1973, Ser. No. 338,360
Int. Cl. H01r *43/00*
U.S. Cl. 29—628 **8 Claims**

1. A method for making an integrated circuit assembly of the type including at least one lead attached to at least one component by a conductive bond connection comprising the steps of:

fabricating said lead from a material having a shape memory characteristic;

straining said lead to a first position;

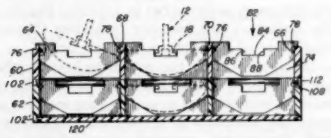
placing said lead in a position for eventual contact with a conductive bond; and

heat treating said lead to effect said shape memory, thereby reversing the strain and permitting said lead to engage the conductive bond and be retained by said bond after the heat treatment.

3,854,201
SYSTEM FOR DISPENSING RAZOR BLADE CARTRIDGES

Jan Dawidowicz, Fairfield, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 270,138, July 10, 1972, Pat. No. 3,783,493, which is a continuation-in-part of Ser. Nos. 191,665, Oct. 22, 1971, Pat. No. 3,783,510, and Ser. No. 236,723, March 21, 1972, Pat. No. 3,785,051, and Ser. No. 258,682, June 1, 1972, abandoned. This application May 21, 1973, Ser. No. 361,921The portion of the term of this patent subsequent to Nov. 13, 1990, has been disclaimed.
Int. Cl. B26b *21/22*; A45d *27/24*; B26b *21/24*
U.S. Cl. 30—40.2 **4 Claims**



1. A system for dispensing razor blade cartridges comprising:

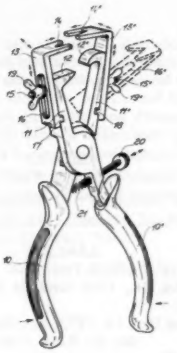
a plurality of razor blade cartridges, each one of said cartridges including slidably engageable surfaces formed transversely thereof;

a holder having a plurality of supporting surfaces formed transversely thereof for selective sliding engagement with the slidably engageable surfaces of said plurality of cartridges;

3,854,202
WIRE CUTTER FOR ELECTRICAL USE

Gaetano Cortese, Via Ada Negri 9, and Francesco Cortese, Via Vitt. Veneto 34, both of Cormano, Italy

Filed Oct. 10, 1973, Ser. No. 405,050
Claims priority, application Italy, Oct. 13, 1972, 23390/72[U]
Int. Cl. B21f *13/00*
U.S. Cl. 30—91.2 **6 Claims**



1. A combined wire-cutting and insulation-stripping tool comprising, in combination, a pair of elongated arms having spaced end portions and articulated to one another intermediate said end portions; biasing means extending between said arms and urging the same away from one another; a pair of wire-cutting jaws rigidly connected to the associated end portions of said arms and extending transversely thereto toward one another and adapted to overlap each other, each of said wire-cutting jaws having a cutting edge adapted to cooperate with the cutting edge of the other jaw for engaging and severing a wire introduced therebetween; a pair of stripping jaws connected to said associated end portions and adjustable longitudinally thereof so as to select the distance between said wire-cutting and stripping jaws, each of said stripping jaws having a free end portion extending transversely of the respective arm toward the free end portion of the other stripping jaw and being provided with a V-shaped recess, said V-shaped recesses being adapted to cooperate with one another to sever the insulation of the wire; and an abutment for adjusting the extent of movement of said arms and said stripping jaws toward one another in dependence on the diameter of the wire to be severed and stripped.

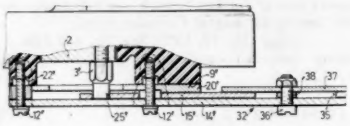
3,854,203
ELECTRICALLY OPERATED MANUAL POWER TOOL

Kurt Paule, Stuttgart; Gunter Zilly, Oberaichen, and Willy Reiss, Uhingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 27, 1973, Ser. No. 373,960
Claims priority, application Germany, July 22, 1972, 2236105
Int. Cl. B26b *19/02*
U.S. Cl. 30—220 **5 Claims**

1. In an electrically operated manual power tool, a combination comprising a housing; a rotatable member journalled

for eccentric rotation relative to said housing and accessible exteriorly of the latter, said rotatable member having a plurality of tapped bores of different diameters; a tool mountable on said housing and comprising at least one stationary component, and at least one movable component connected with and movable relative to said stationary component and provided with a slot; a plurality of projecting portions, all of said projecting portions being threaded and having different diameters



so as to be usable only selectively and in conjunction with a corresponding particular one of said bores, one of said projecting portions being threaded into the corresponding particular one of said bores fixed with said rotatable member for movement therewith and extending into said slot so as to impart periodic movement to said movable component; a mounting face located in the plane of movement of said projecting portion; and connecting means for connecting said stationary component to said mounting face.

3,854,204

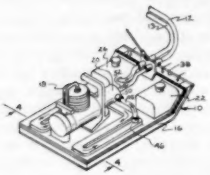
SELF CONTAINED PRUNING MECHANISM

Adrian Gonzales, Jr., 1300 Graham Hill Rd., Santa Cruz, Calif. 95060

Filed Dec. 19, 1973, Ser. No. 426,066

Int. Cl. B26b *15/00*

U.S. Cl. 30—228 **11 Claims**



1. A self contained, power operated device comprising a partially hollow sled, a motor mounted on the sled, a fluid pump having inlet and output ports and being mounted on the sled and powered by the motor, a first portion of the hollow sled being coupled to the pump to act as a fluid reservoir, a fluid actuated device, a mast assembly for supporting the fluid actuated device, the mast assembly having inner and outer coaxial tubes at least one of which is operatively connected to the fluid activated device, and control means for selectively providing a fluid path between the pump and the coaxial tubes such that one of the coaxial tubes is operatively connected to the pump, the coaxial tubes being rigidly interconnected at both at their ends and means for placing the coaxial tubes in compression and tension relative to each other.

3,854,205

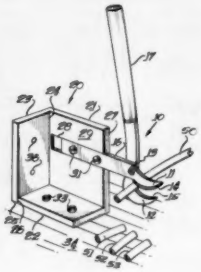
HOSE CUTTING DEVICE

, Jr. Boskus, 63 Turnage Trl., Carlile Highlands, Rt. No. 5, Mt. Home, Ark. 72653

Filed Apr. 18, 1973, Ser. No. 352,118

Int. Cl. B26b *13/00*

U.S. Cl. 30—231 **6 Claims**



1. A hose cutting device adapted for use in cutting hoses of various lengths and diameters into selected lengths comprising:

a shears having a pair of opposed cutting jaws pivotally connected together at a point rearwardly of the jaws for pivotal substantially parallel cutting type movement toward and away from each other;

a mounting bracket including a support member adapted for supporting one of the cutting jaws in a stationary manner;

a handle member attached to the other cutting jaw for operation thereof in a movable manner relative to the stationary cutting jaw;

means securing the stationary cutting jaw to the support member of the mounting bracket;

means adapted for securing the mounting bracket to a supporting surface;

a substantially flat shaped vertically disposed stationary jaw support member having a top edge, a bottom edge, a front edge, and a back edge;

a first substantially flat mounting base having a side edge connected to the bottom edge of the support member and projecting substantially perpendicularly outwardly therefrom in a horizontal plane, the first mounting base member including a front edge, a back edge, and an outermost projecting side edge;

a second substantially flat mounting base member having a side edge connected to the back edge of the support member with a bottom edge connected to the back edge of the first mounting base member and projecting vertically in a plane normal to both the plane of the support member and the plane of the first mounting base member; a slot provided in the support member extending from the front edge of the support member and disposed substantially normal to the plane of the front edge of the support member, the slot adapted to receive therein a portion of the stationary jaw member in a manner fixedly supporting the stationary jaw member projecting forwardly of the front edge of the support member; and

the combination of the two mounting base members providing a universal type of mounting bracket for the support member with the first mounting base member adapted for mounting generally to a horizontal support surface and with the second mounting base member adapted for mounting generally to a vertical support surface such that the shears may be positioned in any desired location for convenient hose cutting.

3,854,206

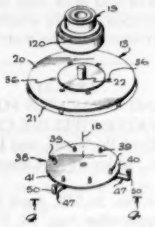
PIERCING OF SUCTION HOLES IN SANDING DISCS

Alma A. Hutchins, 49 N. Lotus Ave., Los Angeles, Calif. 91107

Division of Ser. No. 282,348, Aug. 21, 1972,. This application July 16, 1973, Ser. No. 379,210

Int. Cl. B26f *1/00*

U.S. Cl. 30—368 **8 Claims**



1. For use with a portable sander having a power driven essentially circular backing structure which is adapted to carry an essentially circular abrasive sheet and contains a plurality of spaced suction openings through which air and abraded particles are withdrawn by suction from a work surface, a piercing tool comprising:

a plate adapted to extend essentially transversely of a predetermined axis;

a plurality of projections attached rigidly to said plate and projecting therefrom in a predetermined axial direction at locations spaced about said axis in a pattern corresponding to the pattern of said suction openings; said projections terminating in essentially sharp ends for piercing holes in said abrasive sheet upon movement relative thereto;

a first locating element carried by said plate at the periphery thereof and projecting generally in said predetermined axial direction and then extending generally radially inwardly at a location axially beyond said ends of said projections in said predetermined axial direction to engage a peripheral recess in said backing structure beyond said abrasive sheet; and

a second locating element carried by said plate at the periphery thereof and at a location offset circularly about said axis less than 180° therefrom; said second locating element projecting generally axially in said predetermined axial direction and then generally radially inwardly at a location axially beyond said ends in said predetermined axial direction to engage a second peripheral recess in said backing structure beyond said abrasive sheet.

3,854,207

ORTHODONTIC BRACKET WITH SPRING CLIP RETAINER MEANS

Alexander J. Wildman, Eugene, Oreg., assignor to Silverado Industries, Inc., Napa, Calif.

Filed Aug. 13, 1973, Ser. No. 387,908

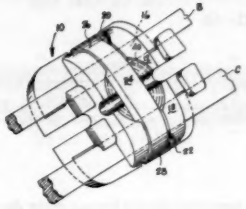
Int. Cl. A61c *7/00*

U.S. Cl. 32—14 A **14 Claims**

1. An orthodontic bracket comprising,

a base defining a pair of spaced, longitudinal channels, each of said channels having an opening for receiving at least one arch wire, said base further defining a pair of detents within opposed sides of said base, with a portion of said detents proximate to said channels extending further into said base than the remaining portion,

a U-shaped spring clip fitting about the bracket transversely adjacent to the opening of each of said channels, said clip having a pair of ears at the clip ends of a dimension less than the co-linear dimension of said detents for engaging a portion of the detents, said spring clip having spring force tending to push said ears together so that said spring clip closes said channel openings and permits arch wire release when said spring clip ears are moved within said detents to respective positions above said channel openings.



3,854,208

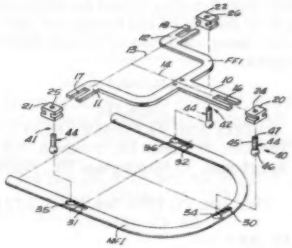
DENTAL FACE BOW ASSEMBLY

Gene W. Arant, 2444 Jupiter Dr., Huntsville, Ala. 90046

Filed Jan. 19, 1973, Ser. No. 324,957

Int. Cl. A61c *9/00*

U.S. Cl. 32—19 **13 Claims**



1. A dental face bow assembly comprising:

a rigid fixed frame adapted to be supported from a mouthpiece held in the mouth of a patient, said fixed frame having left and right lateral arms and a forward arm;

a unitary, rigid generally U-shaped movable frame adapted to extend around the face of the patient, having means on its ends for aligning both of its ends, concurrently, with the hinge axis of the patient's jaws as represented by a pair of reference points on the patient's face;

an orbital pointer carried by one of said frames and adapted to be aligned to a third reference point on the patient's face;

three individually adjustable support means associated with corresponding ones of said arms for supporting said movable frame at three corresponding support locations whereby said movable frame may be supported in a desired alignment position relative to said three reference points; and

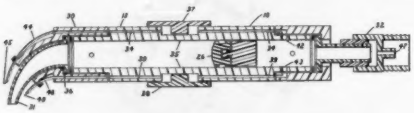
each of said support means including an elevation screw that is manually operable for controlling the elevation of said movable frame at the associated support location.

3,854,209

IMPRESSION SYRINGE

Mark E. Franklin, 29 Kaster Dr., Freehold, N.J. 07728, and James R. Schmidt, 33 Birmingham Dr., Englishtown, N.J. 07726

Filed June 23, 1972, Ser. No. 265,731
Int. Cl. A61c *5/04*
U.S. Cl. 32—60 **4 Claims**



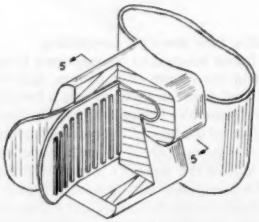
1. In an improved device for use in the deposition of impressionable material into a desired site during the fabrication process, the latter material being subsequently used for the casting of at least one synthetic tooth, said device having: a) a hollow housing having a first and second end of open construction, said housing containing a plunger longitudinally slideable in opposed directions; b) said first end adapted to receive interchangeable heads, one of said heads for use in the suction loading of impressionable material into said housing prior to use, and the other head for use in the ejection of said impressionable material from said housing during such fabrication; and c) said second end adapted with interchangeable fittings, one of said fittings for use in communication with a suction source during loading, and the other of said fittings for use in communication with a pressure source of the gaseous variety during said fabrication, the improvement consisting essentially of: valving means of a manual nature provided on said housing for control of the duration and intensity of air from a source to said site, said flow of air for use in the displacement of the peripheral tissue circumscribing said site, said valving means including at least one longitudinal passageway integral to the side of said housing for said air-flow, the latter air-flow being controlled by a longitudinal valve within said passageway.

3,854,210

MATRIX AND RETAINER THEREFOR

Mark E. Franklin, 29 Kaster Dr., Freehold, N.J. 07728, and James R. Schmidt, 33 Birmingham Dr., Englishtown, N.J. 07726

Filed Jan. 11, 1973, Ser. No. 322,721
Int. Cl. A61c *5/12*
U.S. Cl. 32—63 **2 Claims**



1. The combination of a matrix and retainer adapted for use in the precedure of restoring a tooth, said combination consisting of:

a matrix comprising an elongated body including a tooth engaging portion and two end portions, said end portions adapted to be held together in longitudinal mating relationsjip, each of said end portions including a plurality of outwardly projecting ribs, and

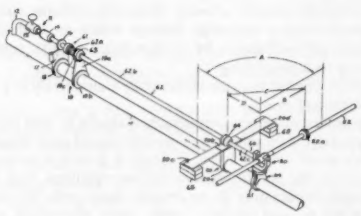
a retainer removably secured to the end portions of the matrix, said retainer comprising an essentially triangular shaped body including a base and first and second upstanding arms, said first arm having a hook projecting inwardly toward the center of the retainer and said second arm having an outwardly projecting flange retained within said hook portion to removably hold the upper ends of the arms together, said retainer further including locking means in the form of projections located on the inside of each of said arms, said locking means gripping said matrix between said ribs whereby relative movement between the retainer and the matrix is prevented.

3,854,211

METHOD AND APPARATUS FOR MAKING AN UNDERWATER PIPELINE CONNECTION

John P. Oliver; Alfred W. Wedel, and Paul T. Priesmeyer, all of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Division of Ser. No. 30,538, April 21, 1970, Pat. No. 3,718,004. This application Aug. 10, 1972, Ser. No. 279,685
Int. Cl. G01b *3/38*
U.S. Cl. 33—1 H **6 Claims**



1. Apparatus for use in measuring the angular relationship of a first pipeline with respect to a second pipeline when said second pipeline is laid across the first pipeline at an underwater location, said apparatus comprising a first member, means for connecting the first member to the first pipeline, a second member connected to the first member for rotation with respect thereto about an axis generally perpendicular to the axis of the first pipeline, said second member having means thereon rotatable into a position to receive a portion of the second pipeline when said second pipeline is laid across the first pipeline, and means for locking the first and second members against relative rotation when said second member is so positioned, the means connecting the first member to the first pipeline being releasable to permit said first and second members to be raised to a position for observation of their relative rotative positions.

3,854,212

FOOT MEASURING DEVICE

Robert A. Rose, 7325 Choctau Rd., Palos Heights, Ill. 60463

Filed Mar. 9, 1970, Ser. No. 17,362
Int. Cl. A43d *1/02*
U.S. Cl. 33—3 A **5 Claims**

1. A foot measuring device comprising, in combination, an elongated resilient stage having marking indicia on one surface thereof, a buttress formed integral with one end of the stage, a keeper formed integral with the stage adjacent to the end opposed to the end having the buttress, said keeper having a sloped wall and having a scarp, said sloped wall of the keeper facing away from the buttress, said scarp of the keeper facing the buttress, a slide moveably mounted on the stage between the keeper and the buttress, said slide having a resilient saddle engageable with the stage, said saddle having a base adjacent to the stage and being cooperative with the marking indicia on the stage, a pair of opposed side walls formed integral with the

base and adjacent to opposite elongated sides of the stage, and an ear formed integral with each of the side walls and extending toward the other ear, the distance between the base and each of the ears is less than the height of the stage plus the maximum height of the keeper for holding the slide between

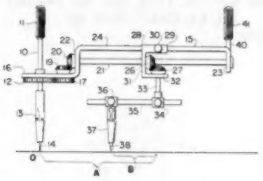
the keeper and the buttress, said distance is sufficiently great to allow the saddle to be forced along the sloped wall of the keeper to deform temporarily the saddle and the stage to allow the saddle to pass over the keeper for slideably locked assembly of the slide and the stage.

3,854,213

ELLIPSE DRAWING COMPASS

Roy Jesse Armitt, 314 St. George St., Toronto, Ontario, Canada

Filed Feb. 12, 1974, Ser. No. 441,755
Int. Cl. B43l *11/04*
U.S. Cl. 33—30 G **1 Claim**



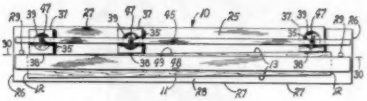
1. A compass for drawing ellipses comprising, in combination, a center post having a first handle at its upper end and a pin at its lower end; a first spur gear fixed to said center post; an arm of flat stock having a centrally disposed end pivotally mounted on said center post above said first spur gear and a free end having an inner vertical portion bent upward from said centrally disposed end, a horizontal portion bent outward from the top of said inner vertical portion, and an outer vertical portion bent downward from said horizontal portion; a first shaft extending through and being journalled in said centrally disposed end of said arm; a second spur gear mounted on said first shaft below the centrally disposed end of said arm and meshing with said first spur gear, said second spur gear having a pitch diameter one half that of said first spur gear; a longitudinal shaft journalled in said inner and outer vertical portions below said horizontal portion of said arm; a first set of meshing first and second miter gears, said first miter gear being mounted on said longitudinal shaft and said second miter gear being mounted on said first shaft above the centrally disposed end of said arm; a downward extending second vertical shaft; a second set of meshing third and fourth miter gears, said third miter gear being slidably mounted on said longitudinal shaft; a bracket having a top flange slidably disposed about said horizontal portion of said arm, clamping means on said top flange to lock said bracket along said horizontal portion of said arm, a vertical back engaging said third miter gear holding said third miter gear in mesh with said fourth miter gear, and a horizontal foot extending from said vertical back under said longitudinal shaft and said top flange, said downward extending second vertical shaft being journalled in said horizontal foot with said fourth miter gear being mounted on said vertical shaft; a drawing element; a beam; a first clamp adjustably fixing said beam to said second vertical shaft; a second clamp fixing said drawing element along said beam an adjustable distance from said second vertical shaft; and a second handle at the free end of said arm so that, when said first handle is held and said arm is swung through 360° by said second handle, said gears rotate said second vertical shaft twice relative to said arm and said drawing element scribes an ellipse.

3,854,214

GUIDE FOR SEVERING SHEET MATERIAL

James H. Crocket, 1442 N. First Ave., Fresno, Calif. 93728

Filed Aug. 20, 1973, Ser. No. 389,699
Int. Cl. B43l *13/00*
U.S. Cl. 33—80 **4 Claims**



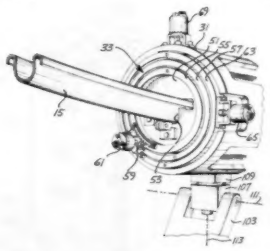
1. A guide for severing sheet material comprising a sheet material receiving platform; pegs secured on the platform in spaced relation defining a line of reference on the platform; a guide plate, having a material abutting edge, positioned in rested engagement with the platform laterally disposed with respect to said line of reference; a pair of second guide plates, having material abutting edges, positioned in rested engagement on the platform; means for securing the material abutting edges of the guide plates in selected positions with respect to said line of reference, said securing means including a cross bar mounted on the platform for adjustment to and from binding engagement with the guide plates; and an elongated sheet material engaging plate, having a knife guiding straight edge, positionable on the work surface with the straight edge thereof engaging the pegs.

3,854,215

MULTIPLANAR SENSOR AND CONTROL SYSTEM FOR USE IN ROLL FORMING MACHINES

Gene B. Foster, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed July 27, 1973, Ser. No. 383,374
Int. Cl. G01b *5/20, 7/28*
U.S. Cl. 33—174 L **14 Claims**



1. A multiplanar sensor suitable for use with a roll forming machine comprising:

a housing having a longitudinal axis;

an end plate mounted in said housing so as to be freely movable in at least one plane, said end plate including an orifice;

a first sensor mounted so as to sense the movement of said end plate in said at least one plane; and,

mounting means for mounting said housing with respect to said roll forming machine in a manner such that a part

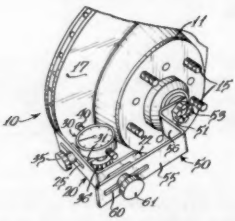
exiting from said roll forming machine passes through said housing and said orifice so as to vary the position of said end plate in accordance with the curvature of the part.

3,854,216

DISC BRAKE TOOL

Charles L. Mosher, Owatonna, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

Filed May 14, 1973, Ser. No. 360,301
Int. Cl. G01b *3/38*
U.S. Cl. 33—181 AT **9 Claims**



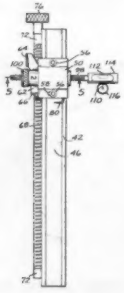
1. A disc brake tool for checking a disc brake rotor for thickness variations and lateral run-out comprising, a gauge arm mountable to a spindle supporting said rotor, a gauge leg carrying an indicator gauge, means on said gauge leg coacting with said gauge arm to mount the gauge leg and indicator gauge in position to check lateral run-out, and additional plane establishing means on said gauge leg to position the gauge leg and indicator gauge independently of the gauge arm with the gauge leg parallel to a face of the brake rotor for checking the rotor for thickness variations.

3,854,217

ELEVATION ADJUSTMENT MECHANISM FOR ARCHERY BOW SIGHTS

Gerald I. Killian, Portland, Oreg.

Continuation of Ser. No. 263,419, June 16, 1972, abandoned. This application Mar. 18, 1974, Ser. No. 451,944
Int. Cl. F41g *1/46*
U.S. Cl. 33—265 **4 Claims**



1. Elevation adjustment mechanism for an archery bow, comprising:

a. an elongated base,

b. a sight support mounted on the outer surface of the base for movement longitudinally thereof and supporting a sight disposed laterally of the base,

c. an elongated micrometer screw mounted on the outer surface of the base and spaced from the sight support for rotation about an axis parallel to the line of movement of the sight support,

d. a latch member mounted on the sight support having a screw-engaging portion movable between an inoperative position disengaged from the screw for movement of the sight support freely along the base and an operative position engaging the screw for movement of the sight support along the base by rotation of the screw, and

e. base mounting means including

1. an elongated arm secured at one end substantially normal to the base intermediate the ends of the base and spaced from the sight support, latch member and screw for unobstructed movement of the latch member, rotation of the screw and movement of the sight support between the opposite ends of the base,

2. a mounting plate mounting the arm for longitudinal adjustment of the arm relative to the plate, and

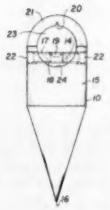
3. means for attaching the mounting plate to an archery bow with the arm extending alongside the bow substantially parallel to the line of sighting of the bow, whereby longitudinal adjustment of the arm relative to the mounting plate effects adjustment of the distance between the sight and the eye of an archer, and with the longitudinal axis of the base disposed substantially parallel to the plane of the bow.

3,854,218

PLUMB BOB AND LEVEL

Harry Cohen, New York, N.Y., assignor to The Raymond Lee Organization, New York, N.Y., a part interest

Filed Apr. 14, 1972, Ser. No. 244,103
Int. Cl. G01c *15/10, 9/32*
U.S. Cl. 33—358 **1 Claim**



1. An improved plumb bob for obtaining accurate determinations of the true vertical point under the point of support of the attached plumb line under conditions which prevent the plumb bob from coming to a static rest position, consisting of a

plumb bob body with means to attach a line directly above the vertical axis of said body, said body being pointed at its nethermost point on said axis, with

a level indicating device incorporated in said plumb bob body visible from the side or from above the body when suspended by the attached line, said level indicating device indicating the level position when the suspended plumb bob body is at the static rest position, in which

the level indicating device consists of a sealed tube containing a liquid and a bubble of air, said tube of the level indicating device being mounted in the upper portion of the plumb bob body, with the longitudinal axis of the tube being perpendicular to the vertical axis of the suspended plumb bob body, with a

handle of circular shape fastened to the upper surface of the body so as to project above the upper surface of the plumb bob body, the undersurface of said handle being notched at its central point directly above the center of gravity of the plumb bob body in the suspended state, with the level indicating device installed parallel to the axis of said handle, so that a flexible line may be attached

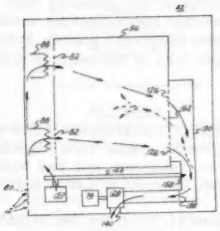
to the plumb bob handle by being looped through the notch of the handle, said notch attachment point ensuring that the level indicating device will indicate the level position when the plumb body is suspended from the attached flexible line in the static position.

3,854,219

ELECTRONIC DRYER

James E. Staats, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed June 18, 1973, Ser. No. 370,863
Int. Cl. F26b *3/34*
U.S. Cl. 34—1 **9 Claims**



1. An electronic fabric dryer comprising:

a cabinet having a microwave impermeable drying chamber therein for accommodating fabrics to be dried;

generating means including a magnetron for producing microwave energy at a predetermined ultra-high frequency;

air circulating means associated with said drying chamber for circulating a stream of air therethrough;

a conduit coupling said circulating means with said drying chamber thereby serving as an air duct, said conduit also serving as a waveguide to conduct said microwave energy to said drying chamber;

an air inlet disposed upstream of said magnetron such that said air stream serves to cool said magnetron while said magnetron serves to preheat said air stream;

a heat source disposed in said air stream upstream of said drying chamber for further heating said preheated air stream before it enters said drying chamber thereby serving to accelerate the drying process;

output means coupling said magnetron with said conduit for transmitting energy from said magnetron to said conduit, whereby moisture from said fabrics is heated and vaporized by said microwave energy and by said preheated air stream and is carried from said drying chamber by said air stream; and

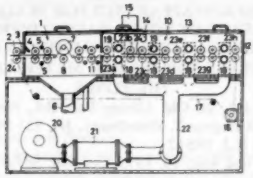
control means associated with said generating means and said heat source, the control means being responsive to the moisture content of said fabrics to interrupt the transmission of microwave energy into said drying chamber and to interrupt the supply of heat to said air stream when said fabrics have reached a predetermined degree of dryness.

3,854,220

METHOD AND APPARATUS FOR CONTINUOUSLY DRYING WET NON-HYGROSCOPIC SURFACES OF SHEET MATERIAL

Morio Yamaguchi, Tokyo, Japan, assignor to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,755
Claims priority, application Japan, July 10, 1972, 47-68804
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **8 Claims**



1. An apparatus for continuously drying wet non-hygroscopic surfaces of a sheet material, comprising:

a. a housing provided with an inlet and an outlet for said sheet material to be dried,

b. plural pairs of squeeze rolls provided in said housing and juxtaposed in the conveying direction of said sheet material, said squeeze rolls being coated with elastic, liquid non-repellent material, and

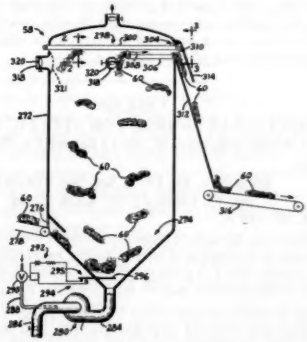
c. hot air supply pipes each being disposed between the adjacent pairs of squeeze rolls with hot air spouts opening in opposition to the respective squeeze rolls along the substantially entire length of the squeeze rolls.

3,854,221

APPARATUS AND METHOD FOR CONTINUOUS DRYING OF LAUNDRY GOODS

Frederick W. Grantham, 600 S. Lairport St., Santa Monica, Calif. 90245

Continuation-in-part of Ser. No. 16,318, March 4, 1970, Pat. No. 3,693,382. This application Sept. 21, 1972, Ser. No. 290,863
Int. Cl. F26b *3/10*
U.S. Cl. 34—10 **10 Claims**



1. A method of continuously drying laundry goods, including the steps of:

continuously introducing the goods into a vertically oriented container;

introducing heated air at the bottom of the container and forcing the air upwardly therein and thereby raising the goods, and so continuously raising them higher as the goods become progressively drier and lighter;

raising only those goods which are sufficiently dry to warrant removal to a predetermined region adjacent the top of the container; and

continuously removing the dried goods from said region adjacent the top of the container by physically engaging said goods and conveying them out of the container.

3,854,222

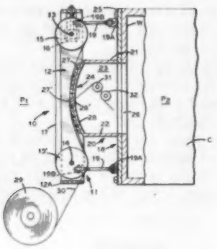
METHOD AND APPARATUS FOR SEALING THE INTERFACE OF ZONES HAVING DIFFERENT ENVIRONMENTAL CONDITIONS WITH AN OPENING IN THE INTERFACE FOR PASSING MATERIAL BETWEEN THE ZONES

Robert M. Lesh, 26 Old Albany Port Rd., Newburgh, N.Y. 12550, and Eugene T. Woodberry, Jr., 131 Plainsboro Rd., Cranbury, N.J. 08512

Filed Aug. 10, 1973, Ser. No. 387,432

Int. Cl. F26b *5/04*

U.S. Cl. 34—15 **13 Claims**



1. Apparatus for subjecting material to successive environmental conditions comprising a chamber maintained internally thereof at an environmental condition different from the environmental condition externally thereof, said chamber including a wall portion formed with an opening therein for passing said material therethrough, said wall portion being arcuate to provide a convex outer surface, means for sealing the opening in said wall portion, said sealing means comprising a flexible member for overlying and pressing said material against the convex surface portion of said wall portion, and means for tightly conforming said flexible member to said convex surface along areas of said convex surface extending from opposite sides of said opening.

3,854,223

MOLECULAR MODELS FOR NUCLEIC ACIDS

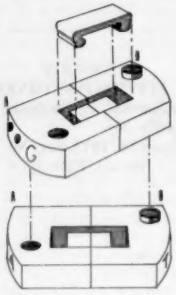
Charles Wesley Dingman, II, 10113 Bevern Ln., Potomac, Md. 20854

Filed Nov. 26, 1973, Ser. No. 419,082

Int. Cl. G09b *23/20;* **A63h** *33/08*

U.S. Cl. 35—18 A **1 Claim**

1. Molecular models of mononucleotides for use in teaching and research consisting of blocks having two configurations of such a design that (a) pairs consisting of one block of each of the two configurations may be held together firmly in horizontal pairs by easily applied clips to illustrate hydrogen-bonded nucleotide pairs having opposite polarity at a scale of either 1mm to 1 A. or 5mm to 1 A.; (b) many blocks of the same configuration may be snapped easily together by means of pairs of magnetic discs embedded in the blocks and then coupled more strongly, if desired, by means of connecting pins to illustrate semi-flexible, single-stranded polynucleotides to the same scales as referred to in part (a); and (c) many pairs of blocks (consisting of one block of each configuration) may be snapped easily together in vertical arrays (as described in (b) above but with each pair rotated 36° in a right-handed



direction with respect to the preceding pair) to illustrate helical double- stranded polynucleotides consisting of two polynucleotide chains of opposite polarity, hydrogen-bonded together, to the same scles as referred to in part (a).

3,854,224

DEVICE FOR HEATING AND DRYING COPY MEDIUMS

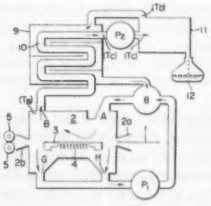
Keizo Yamaji; Hajime Katayama; Toru Takahashi, all of Tokyo; Shoji Ohashi, Yokohama, and Yuji Nishigaki, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 11, 1973, Ser. No. 368,532

Claims priority, application Japan, June 16, 1972, 47-60253; June 16, 1972, 47-60254; June 16, 1972, 47-60255

Int. Cl. F26b *21/06*

U.S. Cl. 34—77 **20 Claims**



1. A device for heating and drying copy mediums in a liquid development type copying machine, comprising:

a heating-drying chamber having an inlet and an outlet for receiving and discharging copy mediums, and including means for heating and drying copy mediums wet with developing liquid;

suction means for sucking air containing developing liquid vapor produced in said heating-drying chamber and for reducing the pressure in said chamber below the ambient air pressure surrounding said machine wherein said suction means comprises a first suction portion for sucking the part of the developing liquid vapor containing air which is at a higher vapor pressure and a second suction portion for sucking the part of said air which is at a lower vapor pressure;

cooling-liquifying means for cooling and liquifying the sucked air containing said developing liquid vapor;

means for collecting the developing liquid liquified by said cooling-liquifying means;

a passageway for circulating air between said heating-drying chamber and said cooling-liquifying means; and

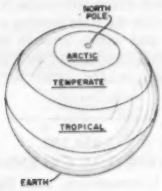
means for blowing the cooled air provided by said cooling-liquifying means through said passageway and into said heating-drying chamber.

3,854,225

ROTATING TANK DEMONSTRATOR

Robert L. Wyener, Casselberry, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 14, 1973, Ser. No. 353,879
Int. Cl. G09b *23/06*
U.S. Cl. 35—19 R **2 Claims**



1. In a training device for demonstrating the effects of Coriolis and the interrelationships of ocean and atmospheric circulation.

three concentric tanks formed by three concentric walls to provide an inner, an intermediate and an outer tank with a common axis of rotation for holding three liquid masses,

means for rotating said tanks and liquids about said common axis of rotation,

the inner of said walls being formed with ports selected in number and size to provide a desired mixing of liquids between adjacent tanks when said tanks are rotated,

means providing color to said separate tanks of liquid, and

heating and cooling means connected to said tanks to provide said inner, intermediate and outer tanks respectively with cold water representative of arctic seas, temperate water representative of the temperate seas and warm water representative of tropical waters to provide, when said tanks are rotated, the varied swirl patterns of the Coriolis effect induced by liquid circulation movements and currents of warm water intermixing with more dense cold water.

3,854,226

ELECTRONICALLY OPERATED MACHINE FOR TEACHING MATHEMATICS

David L. Divine, and Darrell L. Vines, both of P.O. Box 16305, Lubbock, Tex. 79409

Filed Aug. 20, 1973, Ser. No. 389,698
Int. Cl. G09b *19/02*
U.S. Cl. 35—31 C **8 Claims**

1. A teaching machine for teaching mathematic tables to a student and for aiding the student to memorize the table COMPRISING:

a a case,

b four memories in the case,

c a function switch means for enabling one of said memories,

d a first number switch means for addressing the enabled memory,

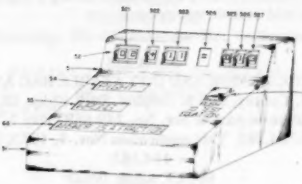
e a second number switch means for addressing the enabled memory,

f an answer switch means for generating a student answer,

g a comparitor in the case,

h a display means on the case for displaying the results of the comparitor,

hh said display means including the following indications



i right

ii wrong

iii the answer is a fraction,

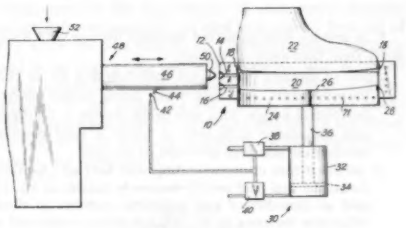
j said comparitor connected to said enabled memory, said answer switch means, and said display means.

3,854,227

FOOTWEAR HAVING A TWO-COLOR RUBBER SOLE

John F. Borisuck, and Reuben A. La Chall, both of New Haven, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 61,457, Aug. 5, 1970, Pat. No. 3,751,200, which is a division of Ser. No. 729,570, May 16, 1968, Pat. No. 3,608,004. This application May 4, 1973, Ser. No. 357,432
Int. Cl. A43b *1/10*
U.S. Cl. 36—4 **2 Claims**



1. In an article of footwear having an upper and a two-color rubber sole; the improvement wherein said sole comprises

A. a rubber midsole-foxing component vulcanized to said upper; and

B. a rubber outsole component vulcanized to said midsole-foxing component;

C. said midsole-foxing component consisting of

i. a midsole portion underlying and vulcanized to the inwardly lasted bottom margin of said upper, and

ii. a foxing portion, said foxing portion having

a. a first peripheral lip-shaped section extending upwardly relative to said midsole portion and vulcanized along its inner surface to the bottom side portion of said upper, and

b. a second peripheral lip-shaped section extending downwardly relative to said midsole portion and having a downwardly and outwardly slanted inner surface;

D. said outsole component being disposed within the confines of said second lip-shaped section of said foxing portion and having a correspondingly downwardly and outwardly slanted peripheral surface, said outsole component being vulcanized along said slanted peripheral surface thereof to said slanted inner surface of said second lip-shaped section and along the top surface of said out-

sole component to the bottom surface of said midsole portion, said outsole component having a thickness substantially equal to the height of said second lip-shaped section, and no part of the rubber of said outsole component showing as a blemish on the outer surface of said foxing portion; and

E. said midsole-foxing component having a higher modulus than said outsole component.

3,854,228

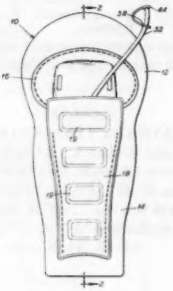
ATHLETIC ARMOR AND INFLATABLE BAG ASSEMBLY

Robert E. Conroy, 505 S. Delphia, Park Ridge, Ill. 60068

Continuation-in-part of Ser. No. 249,668, May 2, 1972, Pat. No. 3,784,985. This application Nov. 9, 1973, Ser. No. 414,183

Int. Cl. A43b *19/00*

U.S. Cl. 36—71 **7 Claims**



1. A unitary foot inflatable member for use with a substantially rigid foot gear, including,

a pair of flexible plastic side walls forming an air chamber therebetween, said side walls being sealed along their peripheral edges, said side walls having a configuration and dimension sufficient to cover a heel portion and substantial side foot portions of the user,

an air-fill means communicating with said air chamber, and means to seal said air-fill means to retain air blown into said air chamber of said inflatable member to allow said inflatable member to be inflated when positioned within said foot gear, and

said inflatable member having upper and lower edges, said inflatable member being elongated with a central heel portion and side foot portions, said side foot portions being spaced from each other in a preset arched configuration, and

a linking member connected at the opposite ends to the lower edge of the side foot portions so that the linking member fits against the bottom of the heel, whereby the inflatable member assumes said preset arched configuration.

3,854,229

LAMINATED LABEL OR SIMILAR ARTICLE

Burton D. Morgan, Hudson, Ohio, assignor to Morgan Adhesives Company, Stow, Ohio

Continuation-in-part of Ser. No. 8,508, Feb. 4, 1970, abandoned. This application Aug. 13, 1971, Ser. No. 171,511

Int. Cl. C09j *7/04*

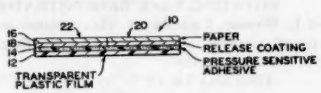
U.S. Cl. 40—2 **2 Claims**

1. An initially complete three layer laminated label comprising:

a first or surface layer of transparent plastic film,

a second layer of transparent pressure sensitive adhesive on one surface of said film and coextensive therewith, and permanently bonded thereto and

a third layer of paper having a release coating on the entire area of a first surface thereof applied to said adhesive layer and coextensive therewith with said release coating being adjacent said adhesive layer, said paper layer having a removable center portion and a removable separate outer portion whereby said outer portion can be removed to expose the peripheral part of the adhesive layer, said



center portion being adaptable to having data applied on an exposed second surface thereof and, when so applied, the center portion being removable to be reapplied to the adhesive layer with the data bearing surface adjacent said adhesive layer and visible through said first and second layers, said second surface of said center portion being initially exposed in the label for receiving printing thereon.

3,854,230

PERPETUAL CALENDAR

Dennis A. Knaus, Germantown, and Richard E. Wysocky, Grafton, both of Wis., assignors to Jos Schlitz Brewing Company, Milwaukee, Wis.

Filed Sept. 4, 1973, Ser. No. 393,788

Int. Cl. G09d *3/00*

U.S. Cl. 40—107 **5 Claims**

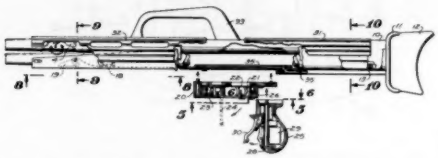
1. A perpetual calendar, comprising a first panel having a first upper portion and a first lower portion including a supporting projection, a second panel having a second upper portion spaced from said first upper panel portion and a second lower portion connected to said supporting projection of said first panel, a first, second and third pivot assemblies connected in spaced relationship to said first upper panel portion, a first group of indicia bearing members each displaying a different units digit or the days utilized to represent the month rotatably connected to said first pivot assembly having means for selective independent rotation between a first position wherein said selected members are masked by said second upper panel portion and a second position wherein a first selected member from said first group is displayed, a second group of indicia bearing members each displaying a different tens digit utilized to represent the days of the month rotatably connected to said second pivot assembly having means for selective independent rotation between a first position wherein said selectd members are masked by said second upper panel portion and a second position wherein a second selected member from said second group is displayed, and a third group of indicia bearing members each displaying a different month of the year rotatably connected to said third pivot assembly having means for selective independent rotation between a first position wherein said selected members are masked by said second upper panel portion and a second

position wherein a third selected member from said third group is displayed, said selected first, second and third displayed members being adjacently located and providing in combination a preselected calendar date.

3,854,231
ELECTRICALLY FIRED MULTIPLE BARREL SUPERIMPOSED PROJECTILE WEAPON SYSTEM

Howard F. Broyles, 4841 Maryland Ave., La Crescenta, Calif. 92014

Filed Sept. 26, 1968, Ser. No. 773,691The portion of the term of this patent subsequent to Sept. 17, 1989, has been disclaimed.
Int. Cl. F41c *19/12*
U.S. Cl. 42—84 **8 Claims**



1. An electrically operated gun system and ammunition therefore comprising:

a. an elongated receiver including a trough portion;

b. a cluster of gun barrels operatively mounted thereon in said trough portion with the breech portions pivotable out of said trough for reloading;

c. a combination breech block and recoil mechanism rigidly mounted to said receiver;

d. a trigger removably mounted on said receiver;

e. an electrical power source and related circuitry operatively disposed within said gun; and

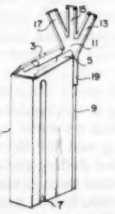
f. an electrically fired multiple charge cartridge adapted to be fired in said gun, wherein

said breech and recoil mechanism comprise a generally rectangular breech block adapted to receive and hermetically seal the breech end of the barrel cluster, the forward face thereof being provided with a plurality of electrical connections capable of transmitting electrical power to cartridges disposed in said barrels and a piezoelectric element disposed adjacent thereto in a manner so as to receive the recoil force of each cartridge each time it fired so as to generate power thereby.

3,854,232
CLIP HOLDING GUIDE

Daniel D. Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Jan. 16, 1974, Ser. No. 433,744
Int. Cl. F41c *27/00;* **F42b** *39/06*
U.S. Cl. 42—87 **17 Claims**



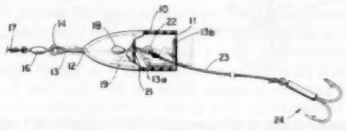
1. A clip holding guide comprising:

means for attaching said guide to a magazine and a plurality of convergent clip support means, each positionally adapted for retaining a cartridge clip in a loading position relative to said magazine when said guide is attached to said magazine.

3,854,233
FISHING LURE

Paul T. Browning, III, 1825 Zinnia Dr., Indianapolis, Ind. 46219

Filed Oct. 17, 1973, Ser. No. 407,221
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.29 **3 Claims**

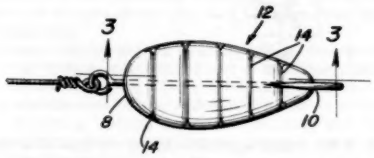


1. A fishing lure having a tubular body with a leading closed end and a trailing open end, a wire extending centrally through said body and leading closed end and protruding substantially beyond said leading closed end, said wire being slidable within the body between positions of maximum and minimum extension from the leading end of the lure body, a line or leader attaching eyelet formed on the extending tip of said wire, the opposite end of said wire having a transversely bent tip which is positioned at said trailing open end of the body when said wire is in said maximum extended position and is spaced exteriorly of the open trailing end of the body when the wire is in said minimum extended position, a detachable tail component for the lure formed of elastomeric material and adapted for impalement on said transversely bent tip of the wire when the wire is in its said minimum extended position and being drawn into said body when the wire is moved to its said maximum extended position, a hook-bearing member attached to an eyelet formed in said wire, said hook-bearing member extending from the trailing end of said body and carrying at least one hook adapted to be imbedded in said elastomeric tail component.

3,854,234
CATFISH BAIT

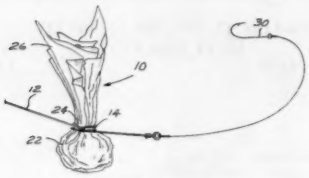
John M. Hardin, P.O. Box 138, Calhoun City, Miss. 38916

Filed July 11, 1973, Ser. No. 378,142
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.06 **4 Claims**



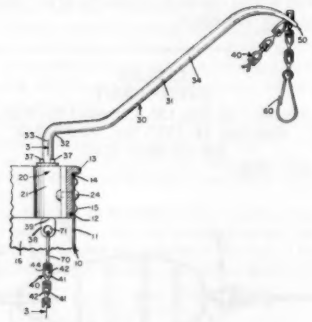
1. An artificial fishing bait comprising, in combination, an edible doughball-type core molded to assume and maintain a prescribed shape resembling a larval form known to appeal to certain fish, catfish for example, and a shape retaining and texture preserving jacket snugly encasing, retentively encapsulating and completely covering said core, said core containing cheese, cereal grains, mixture of corn syrup, animal by-products and preservatives, and said jacket comprising a grade of moldable plastisol which is porous, absorbs and emits enticing and tantalizing odors and liberates flavor known to be savory and attractive to fish.

3,854,235
QUICK-RELEASE CASTING WEIGHT MEANS
Robert L. Thompson, 5583 Riverview Dr., Riverside, Calif. 92509
Filed Aug. 20, 1973, Ser. No. 390,014
Int. Cl. A01k *95/00*
U.S. Cl. 43—43.12 **8 Claims**



1. Quick-release casting weight means suitable for use in the casting of a baited fishing line to a desired spot on the water for surface fishing purposes, comprising at least one casting weight and at least one piece of paper adapted to come apart immediately upon contact with said water, said paper being wrapped around said casting weight in such manner as to permit the attachment of said fishing line to the paper so that the weight means remains affixed to said line until the latter is cast to said desired spot; whereby the line with said weight means so attached can be cast to said spot, and said paper then immediately begins coming apart in said water to release the casting weight which sinks without dragging the line down so that said line remains substantially at the surface of the water.

3,854,236
FISH BAG HOLDERS
Dean L. Goserud, St. Paul, Minn.
Filed Feb. 26, 1973, Ser. No. 336,026
Int. Cl. A01k *97/00*
U.S. Cl. 43—55 **3 Claims**



1. A fish holder applicable to the oar lock of a boat and adapted to cooperate with a suspension member having spaced protrusions, said holder comprising:

a. an upstanding journal adapted to be inserted into the oarlock,

b. an arm extending outwardly from the upper end of the journal,

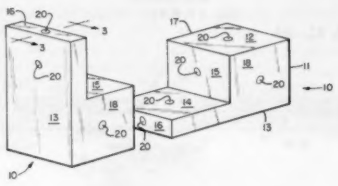
c. the outer end of said arm having spaced shoulders between which said suspension member may be disposed,

d. the protrusions of said suspension member being engagable with said shoulders to restrain downward longitudinal movement of said suspension member,

e. the space between said shoulders communicates with an opening in said outer portion of the arm and through which the suspension member and protrusions may freely pass,

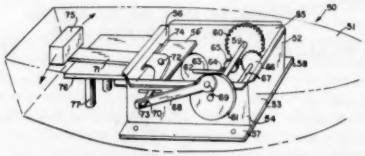
f. said opening being at a higher elevation than the space between said shoulders.

3,854,237
TOY BUILDING BLOCK
Richard Bert Loth, 424 Sowams Rd., Barrington, R.I.
Filed Nov. 3, 1972, Ser. No. 303,524
Int. Cl. A63h *33/10*
U.S. Cl. 46—26 **4 Claims**



1. A set of blocks, each block of which comprises a geometric figure having eight sides, a back side square in shape and having an area with a selected unit of measure, a top side square in shape and at right angles to said back side and having an area equal to the area of said back side, a bottom opposite and parallel to said top side and at right angles to said back side, rectangular in shape and equal to twice the area of said top side, a platform face, square in shape and equal in area to said top side, parallel and opposite to said bottom, an end wall opposite and parallel to said back side and located at right angles to said top side and platform face, said end wall being rectangular in shape and having an area approximately two-thirds of the area of said back side, to provide a recess area in said block, a front wall parallel to said back side and end wall and at right angles to both said platform face and bottom, a left side perpendicular to both said top side and bottom and a right side opposite and parallel to said left side.

3,854,238
TOY BOAT
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Filed Feb. 26, 1973, Ser. No. 335,574
Int. Cl. A63h *23/02*
U.S. Cl. 46—93 **5 Claims**



1. A toy comprising in combination:

a hull adapted to float on water,

means for propelling said hull through the water,

a movable weight for shifting the center of gravity of said toy as it is propelled through the water in an oscillating manner to cause said hull to rock about an axis which is substantially parallel to the longitudinal axis of the hull so as to cause the toy boat to rock from side to side during its movement through the water and to simulate the operation of a boat in rough seas.

3,854,239
ATTACHMENT STRUCTURE FOR PUPPET, MANIPULATOR COMBINATION

Barbara Williams, Kanarraville, Utah

Filed Mar. 25, 1974, Ser. No. 454,162
Int. Cl. A63h *7/00*
U.S. Cl. 46—126 **4 Claims**

1. In a puppet and manipulator combination comprising a puppet and a manipulator attached thereto, an improvement wherein said puppet has a back surface having secured thereon first attaching means comprising an attachment-type, fabric, flexible overlap member, said manipulator comprising an elongate member provided at one end with an attached plate which is inclined with respect to the axis of said elongate member, second attaching means comprising a releasably securable fabric attachment member secured to said plate and detachably cooperatively self-securable to said flexible overlap member by surface engagement therewith, said fabric attachment member being disposed over said plate, and doubled back over at least one edge of said plate, said fabric attachment member being adhered in place in its doubled back configurement with respect to said plate, said flexible overlap member having, along at least one edge thereof, a foldable flexible overlap portion, said plate with said fabric attachment member being releasably secured to said flexible overlap member in a manner such that said flexible overlap portion is overlappingly disposed around at least said one edge of said plate and in said surface engagement with said fabric attachment member where the latter itself doubles back over said plate edge.

3,854,240
ISOTOPICALLY LABELLED COMPOUNDS

Kenneth Gordon Oldham, Little Chalfont, and Noel Gordon Carr, Liverpool, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 13, 1972, Ser. No. 234,326
Claims priority, application Great Britain, Mar. 12, 1971, 6779/71
Int. Cl. A01h *13/00*
U.S. Cl. 47—1.4 **6 Claims**

1. In a method of making a ^{14}C-labeled compound by growing a micro-organism in a medium provided with a high isotopic abundance of ^{14}C in a form in which it is taken up by the micro-organism, harvesting the organism after the vegetative reproduction thereof and recovering the ^{14}C-labelled compound therefrom, the improvement which consists in using as the microorganism a micro-organism of the genus Anacystis.

3,854,241
PROCESS FOR SOIL IMPROVEMENT

Friedrich Zimmermann, Striegaustrasse 12, 3300 Braunschweig; Ernst Seifert, Otto-Palm-Strasse 6, 3100 Celle; Helmut von Freyhold, Salierplatz 2, 4000 Dusseldorf-Oberkassel, all of Germany; Arnold Saxen, deceased, late of Abt-Jerusalem-Strasse 6, 3300 Braunschweig, Germany, and Elke Carsch, nee Saxen, executrix, 19 Schnellstrasse, Husum, Germany

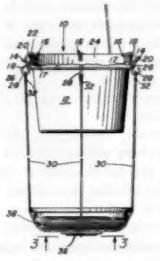
Continuation-in-part of Ser. No. 858,910, Sept. 12, 1969, abandoned. This application Feb. 29, 1972, Ser. No. 230,495
Claims priority, application Austria, Sept. 13, 1968, A8947
Int. Cl. A01b *79/02*
U.S. Cl. 47—58 **5 Claims**

1. A process for improving clayey soils for cultivation consisting essentially of incorporating from 20 to 750 gm/m² of a carbonate of calcium into clayey soils and inducing a gas formation in said soils by chemical reaction by an acidic treatment of said soil with an acidic material selected from the group consisting of acidic silica sols, acid-adjusted sodium silicate suspensions and mixtures of sodium silicates and acidic calcium phosphates, in approximately the stoichiometric amount based on the carbon dioxide content of said carbonate, whereby porous aggregates are built up.

3,854,242
SUPPORT STRUCTURE FOR A RECEPTACLE OR THE LIKE

Alan Gladstein, 8210 Clinton Ave., Los Angeles, Calif. 90048

Filed July 25, 1973, Ser. No. 382,576
Int. Cl. A47g *7/00*; **A01g** *9/04*
U.S. Cl. 47—35 **2 Claims**



1. A support structure for a receptacle being attachable to a hanging flower pot having an upper, enlarged, open end and a lower end, said support structure comprising:

a plurality of hook-attaching means for removably securing to said hanging flower pot, said hook-attaching means comprising:

a brace member defined by an upper semi-circular member formed as an integral part of said hook-attaching means and having a free end extending inwardly of the semi-circular member and then upwardly, to provide a restrictive opening therein for attaching said hook-attaching means to said upper, enlarged, open end of said flower pot;

an intermediate member; and

a lower semi-circular member, wherein said upper semi-circular member, said intermediate member, and said lower semi-circular member are integrally formed in a substantially "S"-shaped configuration;

a plurality of predetermined lengths of cords having terminating free ends;

an eyelet formed in each free end of said cords, whereby said cords are hooked to said lower semi-circular member of said hook-attaching means, said cords depending from said hook-attaching means and forming a loop under said hanging flower pot; and

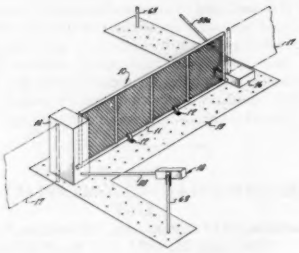
a base plate having a plurality of apertures through which said cords are threaded, said base plate being centrally positioned below said flower pot and intermediate the free ends of said cords.

3,854,243

VEHICLE GATE MECHANISM

Raymond Andre Walker, Orange, Calif., assignor to Stang Hydronics Inc., Orange, Calif.

Filed Aug. 28, 1973, Ser. No. 392,205
Int. Cl. E06b *11/04*
U.S. Cl. 49—131 **16 Claims**



1. A vehicle gate mechanism, which comprises:

a. a vehicle gate element mounted in a roadway for pivotal movement about a predetermined axis,
said gate element being adapted, except when in latched condition, to pivot to open condition when the front end of a motor vehicle pushes thereagainst,

b. a latch element,

c. means to movably mount said latch element for shifting between a latching position which latches said gate element against pivotal movement and a releasing position which permits pivotal movement of said gate element about said axis,
said latch element being adapted to shift back to said latching position unless held in another position,

d. mechanical operating means disposed on one side of said gate element in a position such that the driver in the driver's seat of said vehicle can, while said vehicle is positioned on said roadway and facing said gate element, reach and move said operating means,

e. latch-actuating means adapted, when shifted from an initial location to another location, to move said latch element to a releasing position such that pushing on said gate by said vehicle will effect opening of said gate,
said latch-actuating means being adapted to shift back to said initial location unless held in another location,

f. mechanical means to connect said operating means to said latch-actuating means,
whereby movement of said operating means causes shifting of said latch-actuating means to said other location permitting opening of said gate,

g. means to maintain said latch-actuating means in said other location to thus cause said latch-actuating means to maintain said latch element at said releasing position,
whereby said operating means may be moved back to the initial position thereof, without causing movement of said latch element to a latching position,

h. means responsive to pushing on said gate by said vehicle to release said latch-actuating means and permit shifting thereof back to said initial location, and

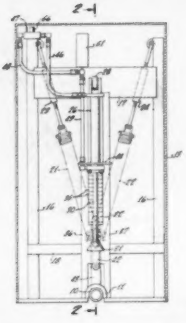
i. means to pivot said gate element to closed condition after said vehicle passes therethrough.

3,854,244

DAMPER AND SPRING-BIAS MECHANISM FOR VEHICLE GATES

Raymond Andre Walker, Orange, Calif., assignor to Stang Hydronics Inc., Orange, Calif.

Filed Aug. 28, 1973, Ser. No. 392,206
Int. Cl. E06b *11/04*
U.S. Cl. 49—131 **9 Claims**



1. A horizontal-axis gate for motor vehicles, which comprises:

a. a horizontal shaft which is mounted for rotation about a horizontal axis,
said axis being disposed relatively adjacent the surface of the roadway,

b. a barrier connected to said shaft and extending upwardly and generally vertically when in closed roadway-blocking condition,

c. support means provided at the side of the roadway adjacent one end of said barrier,

d. a fluid cylinder having its upper end pivotally connected to said support means and extending downwardly toward said shaft,

e. a piston disposed in said cylinder and connected to a piston rod which extends downwardly below the lower end of said cylinder,

f. a pawl mounted at the lower end of said piston rod,

g. cam and ratchet means mounted on said support means adjacent said cylinder,
said cam and ratchet means being adapted to move upwardly and downwardly along a predetermined path,

h. means to associate said cam and ratchet means with said barrier in such manner that said cam and ratchet means moves downwardly upon opening of said barrier and moves upwardly upon closing thereof,

i. means to engage said pawl with the ratchet portion of said cam and ratchet means when said pawl is disposed at the same elevation as said ratchet portion, and

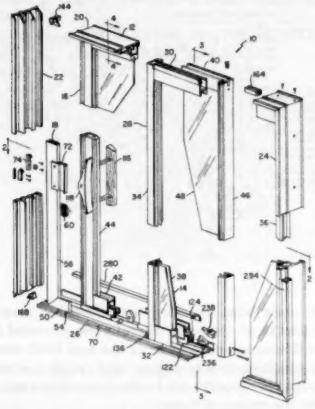
j. bias means to effect upward movement of said barrier to closed condition after a vehicle has passed through the gate,
said cylinder and piston being adapted, when said pawl is engaged with the ratchet portion of said cam and ratchet means, to retard the upward movement of said barrier in response to operation of said bias means,
said cam and ratchet means incorporating a cam portion adapted to effect disengagement of said pawl from said ratchet portion of said cam and ratchet means after said barrier has pivoted upwardly to a predetermined inclined condition,
whereby said barrier may then spring freely upwardly to closed condition in response to operation of said bias means.

3,854,245

BUILDING STRUCTURE

Richard N. Anderson, Owensboro, Ky., assignor to V. E. Anderson, Mfg. Co., Owensboro, Ky.

Filed Jan. 20, 1972, Ser. No. 219,330
Int. Cl. E05d *13/04*
U.S. Cl. 49—449 10 Claims



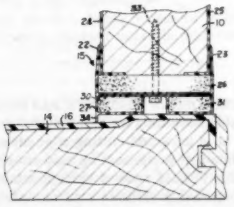
1. Sliding door structure comprising an outer frame having two upper and two lower mitered corners, jambs with a returned fin thereon, a sill and a head with a single door panel guiding fin and at least two additional fins extending inwardly of the frame in spaced relation to the guiding fin on opposite sides thereof, at least one movable door panel in assembly with the outer frame including a top rail in engagement with one of the additional fins and having a slot in the top thereof receiving the guiding fin and at least one fixed door panel positioned between the other additional fin and the movable door panel in assembly with the frame and movable door panel, and weather strip means positioned about the periphery of each of the door panels in assembly in the frame and with the movable door panels in a closed position, and combined weather stops and miter aligning members secured between the sill and jambs at the lower corners of the frame.

3,854,246

THRESHOLD WEATHERSTRIP

Owen E. McAllister, Oshkosh, Wis., assignor to Combustion Engineering Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 179,935, Sept. 13, 1971, abandoned. This application Apr. 18, 1973, Ser. No. 352,263
Int. Cl. E06b *1/70*, *7/22*
U.S. Cl. 49—470 19 Claims



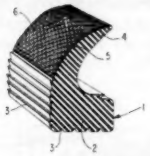
1. Weather sealing means for the bottom of a door comprising a channel member of reinforced plastic material of generally U-shaped cross section which is of sufficient length to enable it to be mounted so as to extend along the entire bottom edge of the door with upstanding side flanges which are flared inwardly at the top edges so as to snugly engage the bottom margins of the exterior and interior door faces, an elongate strip member of resilient, compressible material disposed in said channel member between the bottom edge of the door and the bottom of the channel member which has a width less than the distance between said side flanges, adjustable fastening means for securing the channel member in adjusted position on the bottom edge of the door with said strip member adapted to be compressed in the space between the bottom edge of the door and the bottom of the channel member so as to substantially fill said space while permitting limited adjustment of said channel member on the door edge, and resilient, compressible strip means extending in depending relation along the bottom face of said channel member and between the side edges of the door so as to contact in wiping engagement with the sill surface which confronts the bottom face of said channel member when the door is moved to a closed position thereby to form a weather seal.

3,854,247

SEALING STRIP FOR MOTOR VEHICLES

Karl Stark, Sindelfingen; Werner Achterwinter, and Karl-Heinz Brauer, Sindelfingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed June 6, 1969, Ser. No. 831,173
Claims priority, application Germany, June 6, 1968, 1755665
Int. Cl. E06b *7/23*
U.S. Cl. 49—495 22 Claims



1. A sealing strip made from an elastomeric material for use in doors or the like of motor vehicles which, with a closed door, abuts with a sealing lip means thereof at a painted metal part, said sealing lip means being provided, at least partially on its abutment side, with recess means emanating from the surface thereof, characterized in that said recess means includes a plurality of depressions of minor width which are arranged approximately in mesh form in closely spaced serial relationship such that during use the only contact between the abutment side and the painted metal part is along thin abutment lines formed by the edges of the depressions whereby noises due to relative movement of the painted part and the sealing strip are reduced, and characterized in that the depressions have a pyramid-like shape.

3,854,248

DUCT ACCESS DOOR

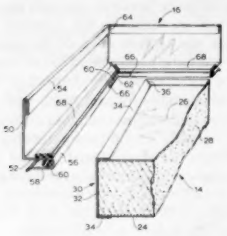
Lloyd Giddis Dayus, 3400 Riverspray Dr., Mississauga, Ontario, Canada

Filed May 21, 1973, Ser. No. 362,043
Int. Cl. E06b *1/04*
U.S. Cl. 49—504 9 Claims

1. Apparatus for manufacturing door frames for insertion into a door opening in a wall, for example in air handling ducts and the like, and comprising:

a door frame forming member adapted to form a rectangular door frame having four corners and defining a frame

sidewall which may be set up into a rectangular frame, a frame facing wall extending from said frame sidewall in a generally L-shaped manner whereby to lie within the frame when the same is set up, channel means formed alongside the facing wall and remote from the sidewall and oriented to receive a portion of the wall surrounding the opening therewith, and,



notch means formed in said frame facing wall and said channel means at spaced intervals to permit bending of said frame sidewall for setting up as aforesaid, and,

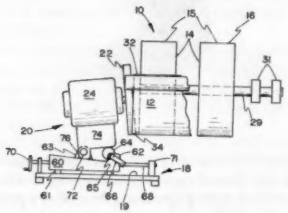
means at at least one end of said frame forming member whereby the ends thereof may be fastened together when the same is in its rectangular position as aforesaid.

3,854,249

DECKLE GRINDER

Wade D. Fletcher, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed July 9, 1973, Ser. No. 377,368
Int. Cl. B24d *7/00, 9/00*
U.S. Cl. 51—75 **8 Claims**



1. A deckle grinder comprising: means for supporting a moving web of material in an arcuate configuration; grinding means for removing a portion of the edge of the arcuate section of the web to provide a deckle; said grinding means mounted at an angle to said supporting means and within said arcuate section of said web, whereby a portion of the web may be removed by the grinding means to provide a uniform and properly angled deckle on the edge of the web.

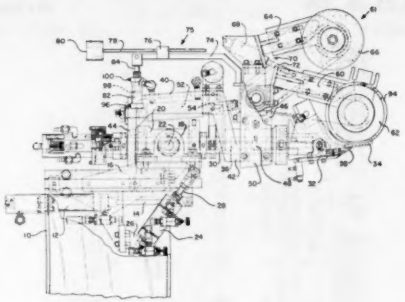
3,854,250

ROUGHING MACHINE HAVING COUNTERWEIGHTED ROUGHING TOOL

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Nov. 1, 1973, Ser. No. 411,608
Int. Cl. B24b *7/00, 9/00*
U.S. Cl. 51—99 **6 Claims**

1. A roughing machine comprising: a mounting member; a tool head assembly pivotally mounted to the mounting member for heightwise movement about a pivot axis and extending forwardly of the axis; a roughing tool mounted to the tool head assembly; a counterweight assembly connected to the tool head assembly and extending rearwardly of said axis; said assemblies being so constructed and arranged that they have opposed and approximately equal moments about said axis; and powered adjustable force applying means connected to one of the assemblies effective to impart heightwise move-



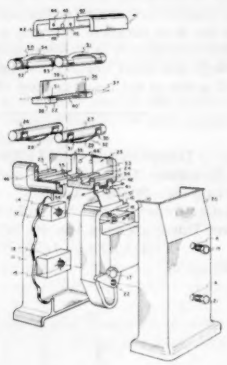
ment to the assemblies including an adjustable downward force to the tool head assembly whereby the powered means may effect a downward movement of the tool head assembly to cause the roughing tool to engage and rough a workpiece with a force that is proportional to the force imparted to the assemblies by the powered means.

3,854,251

SHARPENING DEVICE FOR CUTTING IMPLEMENTS SUCH AS RAZOR BLADES

Michael L. Paule, 8823 South 1275 East, Sandy, Utah 84070

Filed Oct. 12, 1972, Ser. No. 297,006
Int. Cl. B24b *3/48*
U.S. Cl. 51—158 **5 Claims**



1. In combination, means having first and second opposite sides for removably mounting an external cutting implement to be sharpened at at least one cutting edge on said first side; means for rectilinearly reciprocating said mounting means, engaged therewith at said second side; a set of cylindrical honing means disposed proximate said mounting means for honing said cutting edge; and plural clip means releasably receiving and resiliently biasing said honing means toward said cutting edge, and wherein said plural clip means comprise spring clips, said spring clips comprising mutually spaced clip

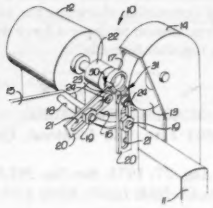
portions and outwardly convex elongate spring portions integral with and connecting said clip portions.

3,854,252

WORK SUPPORT SHOES FOR CENTERLESS GRINDING MACHINES

Arwin O. Lindsay, 13445 Oscar St., Sylmar, Calif. 91342, and Kenneth C. Boalen, 1839A Verdugo Loma Dr., Glendale, Calif. 91208

Filed July 26, 1973, Ser. No. 382,872
Int. Cl. B24b *5/34, 41/06*
U.S. Cl. 51—238 GG **5 Claims**



1. For use in a centerless grinding machine having a grinding wheel, a plate secured to a frame of the machine in general alignment with the circumferential grinding surface of said wheel and extending transversely with respect to the wheel axis, said plate being adapted to be in alignment with a workpiece to be ground by the wheel, chuck means to hold the workpiece between said plate and said wheel in the grinding position, said plate being adapted to extend generally laterally and downwardly of the workpiece in the grinding position, support arms adjustably mounted on said plate and having inner ends adapted to extend toward the workpiece in the grinding position, work support shoes having outer ends adjustably mounted to respective inner ends of said support arms;

the improvement comprising:

said work shoes each having a workpiece contact portion and a shank portion,

each shank portion having an outer and an inner end, said outer ends of said shank portions defining the outer ends of said work support shoes,

each shank portion being made of a phenolic base material having sufficient degree of flexibility to dampen vibrations imparted to its outer end by the grinding machine during the grinding operation whereby vibration of the inner end is substantially eliminated,

each contact portion being mounted on an inner end of a respective shank portion,

the periphery of the inner end of the shank portion being at least substantially coextensive with the periphery of the contact portion, and each contact portion having an inwardly facing surface arranged for contacting and supporting the workpiece,

said contact portion being made of a high density, low porosity, wear resistant ceramic material.

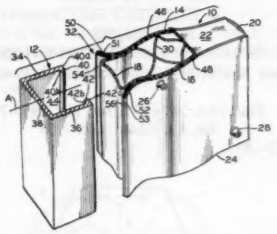
3,854,253

JOINT CONSTRUCTION BETWEEN SUPPORTED AND SUPPORTING MEMBERS

Joseph A. Slowbe, Cleveland, Ohio

Continuation-in-part of Ser. No. 249,681, May 1, 1972, abandoned. This application Jan. 22, 1973, Ser. No. 325,383
Int. Cl. E04b *1/345*
U.S. Cl. 52—2 **10 Claims**

1. A joint structure comprising, an elongated support component having a bottom wall and laterally spaced apart sidewalls, said bottom wall and sidewalls defining a recess, flange means on said sidewalls and extending laterally inwardly thereof to define a restricted entrance to said recess, said flange means having inner surfaces with respect to said recess, and panel means interengaged with said support component, said panel means including an inflatable body of flexible sheet material, a portion of said body extending through said restricted entrance and into said recess, means filling said body and forcing the sheet material of said portion of said body in



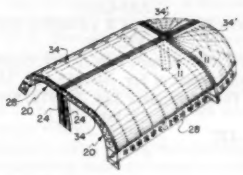
said recess to extend laterally behind said flange means to interengage said panel means and support component against separation outwardly of said restricted entrance, and means prepositioning and supporting said panel means with respect to said support component, said side walls of said support component having outer surfaces with respect to said recess and said prepositioning and supporting means including flap means on said panel means adhesively bonded to said outer surfaces.

3,854,254

PATIO CANOPY STRUCTURE

Michael J. Janosko, 2421 Bridge Ave., Cleveland, Ohio 44113

Filed July 9, 1973, Ser. No. 377,763
Int. Cl. E04b *1/347, 1/32*
U.S. Cl. 52—63 **5 Claims**



1. Patio canopy structure including a main roof sheet support comprising two generally identical end frames each comprising a beam having essentially the shape of one-quarter of an ellipse whose lower end at the apex of the longer ellipse axis is adapted to rest on the ground and whose upper end is at the distal end of the short ellipse axis, each of said beams comprising two substantially parallel upper and lower bars lying in the same vertical plane and filler structure lying in said vertical plane and having inclined portions rigidly secured near their opposite ends to said upper and lower bars respectively and providing a truss effect between said bars, each end frame including a vertical column L-shape in section rigidly secured to said distal end of its associated beam, each vertical column including two vertical planar beams at right angles to each other, each of these last named beams comprising an outer bar at the end of each leg of the L-shape and comprising a common inner bar at the apex of the L-shape, each of said vertical planar beams having a filler structure lying in the same plane as the associated bars and rigidly secured to said associated bars and providing a truss effect there, structure rigidly

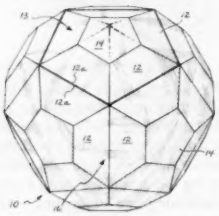
connecting the lower ends of said two end frames, a stringer rigidly connecting the upper ends of said two end frames, a plurality of sheet supporting roof ribs spaced between said end frames and rigidly connected at their opposite ends to said connecting structure and to said stringer respectively, said ribs having the same quarter-elliptical shape as the upper bars of said end frame beams, and a flexible roof cloth covering said canopy structure and secured to said end frames and to said structure rigidly connecting the lower ends of said two end frames and to at least some of said ribs.

3,854,255

SPACE ENCLOSING STRUCTURE

Robert Lisle Baker, 25 Glenland Rd., Chestnut Hill, Mass. 02167

Filed Oct. 24, 1972, Ser. No. 299,678
Int. Cl. E04b *1/34, 7/08*
U.S. Cl. 52—81 **9 Claims**



1. A space enclosing structure comprising:

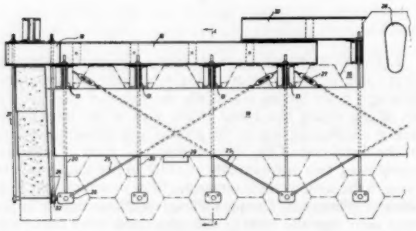
a plurality of trapezoidal structural elements having equal base angles not greater than 58° or less than 54° and assembled in groups of five each to form a plurality of outwardly extending, pentagonal based, truncated pyramidal modules, said modules being assembled in abutting base edge-to-base edge relationship to form at least a portion of a spheroid.

3,854,256

FABRICATION OF FURNACE LININGS WITH SUPPORT FRAME

Brian J. Wilce, Inner Court, Pewley Hill, Guildford, England

Continuation-in-part of Ser. No. 255,188, May 19, 1972, abandoned. This application Jan. 7, 1974, Ser. No. 431,213
Int. Cl. E04c *3/22*
U.S. Cl. 52—122 **6 Claims**



1. A unit for use in the fabrication of furnaces, comprising in combination:

a. a cluster of refractory blocks, said cluster comprising a lower row of blocks having a generally horizontal centre line and an upper row of blocks located above the lower row of blocks, each of at least some of the blocks in the lower row having therein at least one bore that extends through the block from the front to the back face of the block in a horizontal direction generally perpendicular to the centre line of the lower row of blocks,

b. a support frame resting upon the upper row of blocks,

c. a connecting element extending through each of said bores, each said element having a first portion, projecting beyond the front face and a second portion projecting beyond the back face of the block through which said bore passes,

d. a pair of vertically extending load bearing members associated with each connecting element, one of said members being connected to said first portion and the other being connected to the second portion of the element, the upper ends of the members being secured to the support frame,

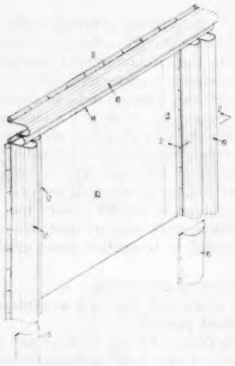
e. wire ropes strung obliquely from the support frame to the points of connection of at least some of the load bearing members and connecting elements, the wire ropes being under sufficient tension to apply a force to hold the cluster of blocks together laterally.

3,854,257

SEALING STRUCTURE

Morris Lobel, 6501 Fern Rd., Montreal, Quebec, Canada (266)

Filed Aug. 27, 1973, Ser. No. 391,096
Int. Cl. E04f *10/04*; **E06b** *1/56*
U.S. Cl. 52—173 **12 Claims**



1. A sealing structure for application to the periphery of a door or like opening which comprises: a first and a second sheet of flexible form-retaining material, each said sheet having first and second parallel longitudinal edges, said sheets being secured together substantially along said first side edges such that said sheets tend to lie together in face-to-face relationship; and means located on each said sheet adjacent the second side edge thereof for attaching said sheet to a wall or like structure.

3,854,258

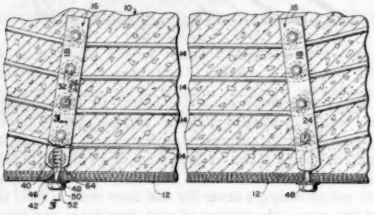
ARTICULATED HOLD-DOWN ANCHOR DEVICE FOR THE EMBEDDED CABLES OF A PRESTRESSED CONCRETE GIRDER

Joseph J. Colado, 666 S. Iowa, Addison, Ill. 60101, and Norman G. Turner, 323 W. Sheridan Pl., Lake Bluff, Ill. 60044

Filed May 17, 1973, Ser. No. 361,216
Int. Cl. E04c *3/10*
U.S. Cl. 52—226 **1 Claim**

1. In a concrete girder form, a horizontal base member upon which wet concrete is adapted to be poured in the production of a prestressed concrete girder, a plurality of tensioning cables extending longitudinally through said form, and a plurality of hold-down anchor devices mounted on said base member for assimilating the upward thrust of the cables when the latter are tensioned, each device comprising an elongated

upstanding frame including a pair of spaced apart parallel side plates, a plurality of transversely extending cable hold-down members extending across said side plates and beneath which the cables extend, a pivot shaft projecting across said side plates in close proximity to the lower ends thereof, said pivot shaft having circular end faces which slidingly engage the inside faces of the end plates, trunnions projecting centrally and outwardly from said circular end faces and extending through holes which are provided in the side plates, said pivot shaft being formed with a diametrically extending bore there-



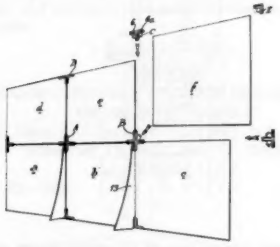
through, the lower ends of said side plates overhanging said pivot shaft, extending a slight distance therebelow, and being formed with arcuate lower edges which are concentric with the axis of the pivot shaft, and an anchor bolt extending upwardly through said base member of the girder form and threadedly received in and projecting completely through said diametrically extending bore and effective under tension to draw the pivot shaft downwardly and thus cause the arcuate edges of the side plates to move into sliding engagement with the upper surface of the base plate when said anchor plate is tightened with an appreciable degree of pressure.

3,854,259

ARRANGEMENT OF PANELS FOR CONSTITUTING DISPLAY UNITS AND SIMILAR

Bernard Louis Lechene, Clichy, France, assignor to Glory Impression Cartonnage, Asnieres, Hauts-de-Seine, France

Filed Dec. 8, 1972, Ser. No. 313,397
Int. Cl. E04c *1/10*
U.S. Cl. 52—293 **20 Claims**



1. A panel arrangement comprising:

at least two rectangular panels each including a cut formed near at least one angle of said panel, said cut extending along a direction substantially perpendicular to the bisectrix of said angle,

a connector comprising:

at least two right-angled arms and protruding means including a hook member between each of said two right-angled arms for insertion in one of said cuts of said panels,

whereby a self-locked connection is provided between said protruding means and said cut in which said protruding means is inserted; and

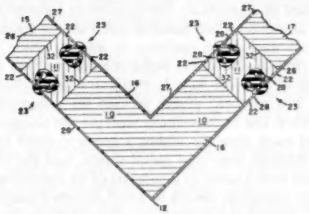
first and second elongated members connected to and substantially parallel to said right angled arms and spaced apart from each other by a distance substantially equal to the thickness of said panel, whereby a lateral groove is formed for receiving the angled portion of said panels.

3,854,260

BUILDING SYSTEM

Edward J. O'Hanlon, Lake George, N.Y.

Continuation of Ser. No. 854,585, Sept. 2, 1969, abandoned.
This application May 4, 1972, Ser. No. 250,202
Int. Cl. E04c *1/00;* **E04b** *2/08*
U.S. Cl. 52—309 **2 Claims**



1. In a building construction formed at least in part of thermally insulating panels each formed of a pair of parallel skins and an intervening layer of insulating material, means for joining two such panels in edge-to-edge relationship comprising in combination,

a flange at each edge of said skin interiorly of the panel and formed by the folding of said edge back upon the skin at an acute angle relative thereto,

a pair of separate resilient joining members each adapted to engage the adjoining skins on a respective one of the sides of the two panels to be joined, each said resilient joining member extending over the full length of the edges of said panels being joined,

each said resilient joining member comprising:

a. a central core portion of outwardly diverging cross section lying between and abutting over at least a portion of its opposed surfaces the opposed flanges of the skins on the respective panels to be joined, said central core portion being provided on its outwardly diverging sides with at least one protruding cam element for forcing said joining member inwardly of said joined panels when the panels to be joined are urged toward each other,

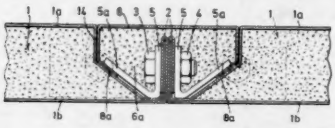
b. a first end portion integrally formed with said central core portion at one end thereof and adapted to flushly fit against the juxtaposed skins on the outside of the panels being joined,

c. and a pair of wing portions each also integrally formed with said central core portion at the other end thereof and each adapted to slide and fit behind a respective one of the flanges of the juxtaposed skins internally of the panels to be joined.

3,854,261
SHELL FOR APPARATUSES WORKING IN SOUND-ABSORBING, HEAT INSULATING OR AIRTIGHT CONDITIONS

Ernst Frei, Konolfingen, Switzerland, assignor to Hermann Pieren AG, Canton of Berne, Switzerland

Filed Nov. 30, 1972, Ser. No. 310,757
Claims priority, application Switzerland, Dec. 9, 1971, 017953/71
Int. Cl. E04c 2/38; E04d 1/36
U.S. Cl. 52—404 5 Claims

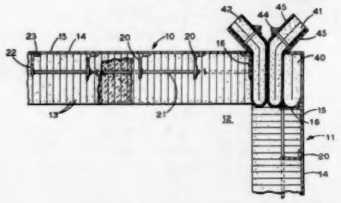


1. In a sound-absorbing, heat insulating or airtight housing for apparatuses, the walls, the bottom and the ceiling of which are assembled of elementary self-supporting insulation plates, each plate comprising two parallel metal sheets arranged at a distance from each other defining an interior space therebetween, the rims of said sheets being pressed together and bent on each side of the plate as to form a shank and a channel, the shanks of two adjacent plates serving for connecting both plates together, the improvement wherein the shanks and the channels of each plate lie within a space defined by planes extending through both said metal sheets, and the shanks of two adjacent plates serve as a support of an insulating means, wherein the insulation means is a soft porous material filling out a space formed at a jointure of adjacent plates, said material being covered from the outside by a cover lid aligning with the outside surfaces of the plates.

3,854,262
INPALED AND COMPRESSED FIBROUS FURNACE LINING

William S. Brady, Western Springs, Ill., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed May 1, 1973, Ser. No. 356,263
Int. Cl. F23m 5/04
U.S. Cl. 52—404 6 Claims

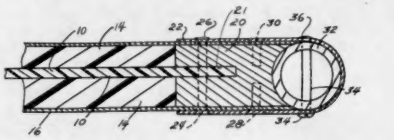


1. An insulation support system for a furnace wall which comprises a plurality of panels arranged in side by side relation on the furnace wall, each panel including a metallic base member and metallic members having a flange attached in transversely spaced attached relation to and extending outwardly of the base member, and means including rods attached to the outwardly extending flanges and extending parallel to and spaced from the base of the panel for impaling and compressing a plurality of strips of heat insulating fibrous materials between flanges within each of the panels to provide a thickness of insulating fibrous materials between the interior of the furance and the metallic parts of the panels.

3,854,263
DOOR BODY

Oliver C. Eckel, P.O. Box 226, Weston, Mass. 02138

Filed Feb. 22, 1973, Ser. No. 334,838
Int. Cl. E04c 2/24
U.S. Cl. 52—615 2 Claims

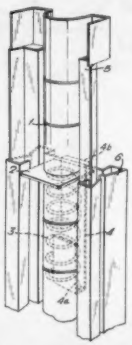


1. A door body comprising a core extending straight and of relatively firm but resilient material, pad means on opposite sides of said door of compressible but resilient material, the latter material being more resilient than said core material, a cover sheet of compliant material exteriorly of said pad means and core and providing a cover for said door body, a solid stile forming the inner side portion of said door body and having a slot extending inwardly from the inner end portion of said body, a portion of said core extending into said slot, said pad means terminating at said stile, said pad means being unitary and reversing itself beyond the outer end of said core.

3,854,264
TELESCOPIC ADJUSTABLE VERTICAL POST FOR PARTION WALLS

Steinar Thomassen, Oesteraas, Norway, assignor to A/S Norenia, Oslo, Norway

Filed Dec. 18, 1972, Ser. No. 315,989
Claims priority, application Norway, Dec. 16, 1971, 04658/71
Int. Cl. E04g 25/04
U.S. Cl. 52—632 5 Claims



1. A telescopic vertical post of adjustable length and used for the support of partition walls, said post comprising a channel-shaped profile beam of metal which at one end is provided with an adjustable extension by means of which the post can be fixed between a floor and a ceiling, said extension comprising a slide member within and telescopically movable along the inner surface of the channel-shaped profile beam, helical compression spring means biasing said slide member upwardly from said profile beam such that it will rest firmly against the lower surface of the ceiling, said spring means being located within said channel-shaped profile beam between transversely opposed surfaces of said profile beam and said slide member, bracket means secured to said profile beam and fixedly supporting the lower end of said helical spring, transverse openings in said slide member spaced along the length thereof and

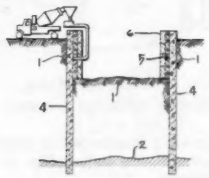
insertably and removably receiving in any one of said openings an abutment member bearing against the upper end of said spring, such that the spring extends upwardly past the lower end of said slide member and biases said abutment member and said slide member upwardly relative to said profile beam, and the extensibility of said slide member is readily adjustable by varying the location of said abutment member along said slide member without varying the location of said spring means in said beam.

3,854,265

METHOD FOR CONSTRUCTING AN UNDERGROUND STORAGE TANK

Akio Kobayashi, Tokyo; Tadao Yamada, Yokohama; Masuo Kawakami, Yamato; Hitoshi Ishioka, Tokyo, and Hideyuki Nishiura, Soka, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1973, Ser. No. 320,005
Claims priority, application Japan, June 12, 1972, 47-58334
Int. Cl. E02d *15/02, 27/38*
U.S. Cl. 52—742 **2 Claims**



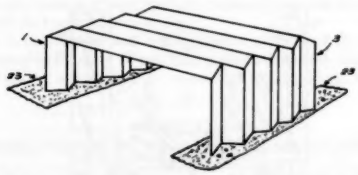
1. A method for constructing an underground storage tank for low-temperature liquefied gas, said method comprising the steps of excavating an annular hole in the soil until a sound foundation is reached; forming a first concrete, outer shell in the annular hole with the outer shell resting on the foundation; removing the soil to the desired depth from the area within the outer shell; vertically stacking a plurality of segments within the outer shell, the stacked segments being positioned inward of the inner wall surface of the outer shell to define an annular space between the outer shell and the vertically stacked segments; filling the annular space with a second, inner shell of concrete; and adding a roof and a bottom to the inner and outer shells.

3,854,266

METHOD OF CONSTRUCTING BUILDING STRUCTURES OF ZIG-ZAG PROFILE

Frank D. Salas, 605 Passaic Ave., Nutley, N.J. 07110

Filed Oct. 18, 1971, Ser. No. 189,868
Int. Cl. E04g *21/14*
U.S. Cl. 52—742 **3 Claims**



1. A method of constructing a building structure of predetermined design formed of walls each having a zig-zag profile bounded by alternating ridges and valleys, each wall consisting of a plurality of edge-wise adjoining and interconnected planar, straight-edged polygonal panels disposed at an angle to one another, comprising the following steps:

A. excavating two parallel trenches spaced from one another at a distance corresponding to the intended width of the building structure, each trench having a length corresponding to the intended length of the building structure, each trench having a width and a depth adapted to receive lowermost zones of two walls of the building structure;

B. juxtapositioning and hingedly interconnecting all panels to form a coplanar, coherent assembly, panels constituting one and the same wall follow each other along the length dimension of said structure and are disposed at an angle of 180° with respect to one another, panels constituting different walls follow each other along the span dimension of said structure, wherein adjoining walls are disposed at an angle of 180° with respect to one another, said coplanar, coherent assembly being laid over said trenches;

C. imparting a dual folding to said coplanar assembly in a single operation for gradually forming said zig-zag profile of all of said walls and, simultaneously, gradually decreasing the angle between adjoining walls, wherein all the angles of inclination between any two adjoining panels in any wall decrease in unison and have all identical magnitudes at any moment of the folding operation, whereby each panel maintains unchanged its planar configuration at all times;

D. dropping, in the course of said dual folding operation, said lowermost zones of two walls into said trenches, whereby said predetermined design is reached;

E. discontinuing, subsequent to step (D), said dual folding operation;

F. fixing, subsequent to step (E), all the hinges between all the panels to obtain a permanently rigid building structure of said predetermined design; and

G. filling, subsequent to step (E), said trenches with a material to permanently immobilize said lowermost zones.

3,854,267

GROUT COMPOSITIONS

David S. Weiant, Moorestown; William R. Velivis, Trenton, and John V. Fitzgerald, Netuchen, all of N.J., assignors to Tile Council of America, Inc., Princeton, N.J.

Filed Mar. 15, 1971, Ser. No. 124,559
Int. Cl. E04f *13/00*
U.S. Cl. 52—744 **24 Claims**

1. A method for setting and grouting tiles in an edge-to-edge, spaced-apart relationship on a support surface, said spaces between the tiles forming joints, the improvement which comprises setting the tiles and filling the joints between the tiles with an aqueous non-hydraulic grouting composition comprising (i) 2–16 percent by weight of a polymer emulsion capable of coalescing upon the loss of water from the grouting composition and having a solids content of 40–75 percent; and (ii) 50–90 percent by weight of a water insoluble filler in which at least 2 percent thereof is spherical glass having a particle size range of from 2 to about 500 microns, said grouting composition having a viscosity of 10,000 to 4,000,000 cps, water retention value of from 10–40, and a volatile component of from 8–20 percent by weight.

3,854,268

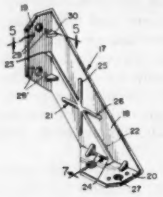
CORNER BRACKET FOR FURNITURE CASE

Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035

Filed Dec. 13, 1972, Ser. No. 314,711
Int. Cl. A47b *96/06*
U.S. Cl. 52—753 D **1 Claim**

1. A corner bracket for a furniture case comprising a unitary substantially rigid member having a substantially flat intermediate portion and upstanding integral end portions disposed generally orthogonally relative to the intermediate portion, the end portions being orthogonally related to each other and so disposed as to bear against a horizontal parting rail and a vertical frame member, respectively, a plurality of

gussets interconnecting said intermediate portion with said end portions, said intermediate portion being equipped with reenforcing rib means, said rib means including a first rib extending generally longitudinally of the member and terminating within the end portions, said rib means also including transverse ribbing to strengthen said member in a plane normal to the plane strengthened by the longitudinal rib, said end portions being equipped with a plurality of screw receiving



openings, each opening on the side of the end portion adapted to confront said parting rail and said frame member being equipped with an outstanding annular flange for biting engagement with said parting rail or frame member as the case may be, said end portions also being equipped with projections on the same surface as is equipped with said annular flanges, said annular flanges projecting outwardly from said surfaces slightly greater than said projections.

3,854,269

CONNECTING MEANS

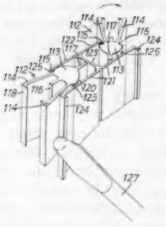
John Philip Hancock, Egham Hill, England, assignor to The British Aluminium Company Limited, London, England

Continuation-in-part of Ser. No. 131,647, April 6, 1971, abandoned. This application Feb. 2, 1973, Ser. No. 329,112

Claims priority, application Great Britain, Feb. 4, 1972, 5330/72

Int. Cl. F16b *5/06*

U.S. Cl. 52—754 **18 Claims**



1. Connection means for connecting the edge of a sheet of material to a member such as the edge of another such sheet comprising: an edging strip having a beading having a longitudinal axis from which beading extend integral leg formations positioned to receive the edge of a sheet of material therebetween, the beading defining externally re-entrant formations circumferentially spaced relative to the longitudinal axis of the beading, the beading having a maximum width on the opposite side of the re-entrant formations from the leg formations, and a securing device defining a channel having a plane of symmetry, the securing device having parts extending towards said plane of symmetry, said parts having ends spaced apart by a distance slightly less than said maximum width, and the beading and securing device being relatively proportioned for snap fitting together by first inserting a first of said parts in one of the re-entrant formations with the other part contacting the beading and then relatively rotating the beading and securing device with said first part acting as a pivot until the other part engages in the other re-entrant formation.

3,854,270

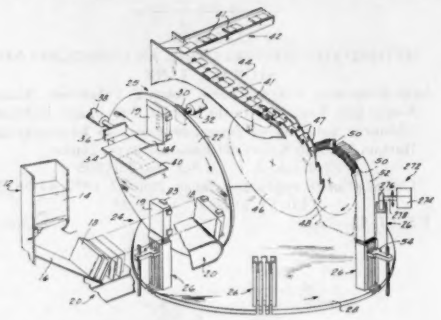
APPARATUS FOR AUTOMATICALLY ERECTING AND LOADING CARTONS

Charles E. Cloud, Wilmette, and Donn Allan Hartman, Zion, both of Ill., assignors to Cloud Machine Corporation, Chicago, Ill.

Filed Aug. 20, 1973, Ser. No. 389,804

Int. Cl. B65b *5/06, 35/50*

U.S. Cl. 53—159 **17 Claims**



1. Packet cartoning apparatus comprising,

a continuously moving horizontal conveyor having a discharge end,

a continuously moving transfer wheel rotatable about a horizontal axis and having its periphery at the discharge end of said conveyor,

said transfer wheel having compartments spaced around its periphery to receive individual packets,

a continuously moving assembly conveyor adjacent the periphery of said transfer wheel and presenting a series of assembly compartments moving past said transfer wheel, each compartment adapted to receive a predetermined number of packets from said transfer wheel,

a holding conveyor below said assembly conveyor and having a plurality of vertical holding compartments,

means for guiding said predetermined number of packets from each said assembly compartment to said holding compartment,

and means for raising said packets out of said compartments and into cartons.

3,854,271

DRIVE MECHANISMS

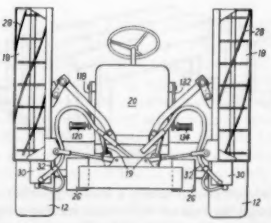
Edward J. Aldred, Ipswich, England, assignor to Ransomes, Sims & Jefferies, Limited, Ipswich, England

Filed Mar. 27, 1973, Ser. No. 344,181

Claims priority, application Great Britain, Mar. 27, 1972, 14343/72

Int. Cl. A01d *75/30*

U.S. Cl. 56—7 **15 Claims**



1. A drive mechanism for driving a plurality of independently rotatable members, comprising a plurality of groups of

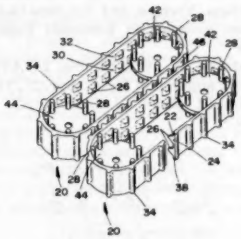
fluid motors with each group including at least one fluid motor, each fluid motor adapted to be connected to a respective one of the rotatable members, a plurality of variable delivery pumps each connected to a separate group of the fluid motors to supply fluid thereto, each of said pumps having a separate control element for varying the rate of delivery of fluid from the respective pump, a prime mover arranged to drive the pumps, and control means operatively connected to the control elements of the pumps so as to vary simultaneously the rates of delivery of fluid from the pumps thereby to vary the speed of rotation of the respective groups of motors while maintaining constant at a pre-set value the ratio of the rates of delivery of respective pumps.

3,854,272

CROP GATHERING BELT

James Murray Lane, III, 12304 E. Iowa Dr., Denver, Colo. 80012, and Guy E. Lingenfelter, 135 Emerald Dr., Broomfield, Colo. 80020

Filed Feb. 20, 1973, Ser. No. 333,934
Int. Cl. A01d *45/02*
U.S. Cl. 56—98 **9 Claims**



1. In harvesting apparatus for gathering and conveying severed crops, said apparatus of the type having two oppositely facing endless means, for conveying crops, gathering means for directing crop to the endless means, and dispersing means for directing crop from the endless means, wherein improvement in the endless means comprises:

at least two oppositely facing generally flat belts each of which is trained around at least two pulleys where at least one pulley for each belt is toothed, each belt comprising:

a first layer of flexible material extending longitudinally of the belt to define a driving portion including a plurality of integrally molded longitudinally spaced lugs adapted to mesh with teeth of the pulley to define a positive belt drive, the lugs having longitudinal and lateral base portions

a second layer of flexible material spaced from and generally parallel to said first layer to define a crop engaging member that includes a plurality of spaced projecting members aligned generally transversely; and

a tensile section of high modulus material disposed between said first and second layers;

said belts adapted and arranged so a portion of the crop engaging member of one belt is juxtaposed with the crop engaging member of the oppositely facing second belt.

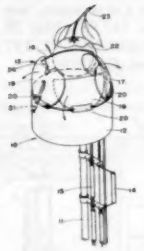
3,854,273

APPARATUS FOR PICKING FRUIT GROWING ON A TREE

Baruch Rosenberg, 4, Hadekaum St., Ramataim, Israel

Filed Oct. 30, 1973, Ser. No. 411,026
Claims priority, application Israel, Nov. 6, 1972, 40744
Int. Cl. A01g *19/08*
U.S. Cl. 56—334 **13 Claims**

1. A cutterhead for picking fruit growing on a tree comprising an open frame to which an elongated rod is attachable and on which a plurality of leaf-plates are pivotally mounted for movement from an open position, uncovering the frame and effecting entry thereinto of a piece of fruit attached by a stem to the tree, to a closed position covering the frame; a spring urging the leaf-plates from closed to open position; a selectively actuatable leaf-plate operator for pivoting the leaf-plates against the action of the spring; the leaf-plates being



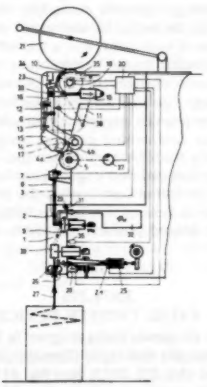
shaped so that, in their closed position, a central opening is defined for holding a stem in a fixed position relative to the leaf-plates; a stem cutter mounted on one of the leaf-plates and having a movable cutter bar whose path of movement crosses the central opening for severing a stem held therein; and a selectively actuatable stem cutter operator for moving the cutter bar.

3,854,274

METHOD AND APPARATUS FOR JOINING BROKEN ENDS

Gerhard Bartling, Burgstall, Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed June 20, 1972, Ser. No. 264,527
Claims priority, application Germany, June 21, 1971, 2130690
Int. Cl. D01h *15/00*
U.S. Cl. 57—34 R **12 Claims**



1. A method for rejoining a broken thread with the spinning fibers in a spindleless spinning machine having a chamber to which the fibers are fed, a turbine for spinning said fibers and means for withdrawing said fibers, comprising the steps of sensing the movement of said withdrawn thread, producing a first signal responsive to a break in said thread, and in response to said signal initiating an automatic program for sequentially stopping the withdrawal of said thread, cutting a portion from the end of said thread, reversing the movement

of said thread to said chamber, producing a second signal responsive to the reverse movement of said cut end, producing a series of impulses in response to said second signal, and after a predetermined number of said impulses recommencing the withdrawal of said thread.

3,854,275

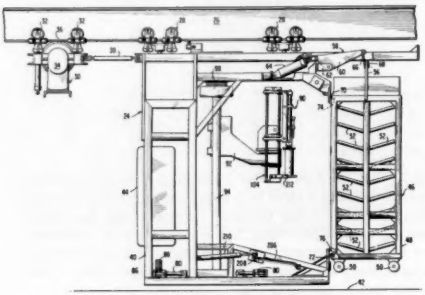
MECHANIZED BOBBIN HANDLER

Thomas J. Bethea, and Joe L. Ritchie, both of Rock Hill, S.C., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 147,951, May 28, 1971, Pat. No. 3,765,160. This application Nov. 12, 1973, Ser. No. 415,286

Int. Cl. D01h *9/10*

U.S. Cl. 57—34 R **2 Claims**



1. In combination, bobbin handling apparatus and a spinning machine having a plurality of bobbin spindles uniformly spaced along the length of the machine, means for propelling the bobbin handling apparatus along the spinning machine and positioning the apparatus in registration with the spindles, said bobbin handling apparatus including a carriage suspended from an overhead rail extending longitudinally of said spinning machine, said propelling means comprising:

a. tractor means having a wheel engaging said rail and a fluid motor driving said wheel;

b. brake means for selectively stopping said wheel;

c. a pair of cams on said spinning machine, a first follower on said carriage operable to reduce power transmitted from said tractor motor to said wheel when said follower engages one of said cams, and a second follower on said carriage operable to apply said brake means when said second follower engages the other of said cams, said cams being arranged on said spinning machine to engage said first follower prior to engagement of said second follower by the other cam as said carriage progresses along said rail, whereby the first cam causes the speed of the carriage to be reduced and engagement by the second follower with the other cam applies the brake means while the carriage is moving slowly, resulting in an immediate stop at the desired position relative to the spinning machine.

3,854,276

FALSE TWISTER DEVICE

Angelo Marzoli, Bergamo, Italy, assignor to F. LLI Marzoli & C. S.p.A., Palazzolo Sull'Oglio (Brescia), Italy

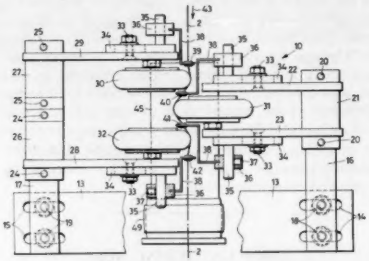
Filed Oct. 25, 1973, Ser. No. 411,354

Claims priority, application Italy, Oct. 31, 1972, 31186/72

Int. Cl. D02g *1/04*

U.S. Cl. 57—77.4 **5 Claims**

1. A false twister device for increasing the volume of textile yarn, and particularly continuous filament synthetic yarn, said device comprising a frame including supports, discs of relatively yieldable material mounted on said supports and having axes parallel with each other and lying in parallel planes to define a zig-zag passage for the yarn, drive means for rotating said discs which come into contact with the yarn traversing the zig-zag passage, said drive means including at least one wear resistant cylinder in contact with said discs to rotate the same



by friction therebetween and means for adjusting the distances between the parallel axes of the discs and between the planes in which they lie.

3,854,277

ELECTRONIC STOP-WATCH AND TIMEPIECE

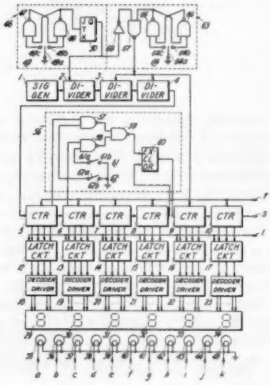
Toshihide Samejima, Yachiyo, and Yasuhiro Ooi, Funabashi, both of Japan, assignors to Kabushiki Kaisha Seikosha, Tokyo, Japan

Filed Apr. 26, 1972, Ser. No. 247,618

Claims priority, application Japan, Apr. 27, 1971, 46-27856

Int. Cl. G04f *9/02*; **G04b** *19/30*

U.S. Cl. 58—39.5 **5 Claims**



1. An electronic time-keeping device usable as a stop-watch and as a timepiece comprising, a signal generator for generating pulses having a base frequency, frequency-dividing means dividing the base frequency in time, time count start-stop means for controlling a time count, counting means for counting the output pulses of said frequency-dividing means and developing therefrom signals representative of a time count having predetermined units of time, latch means comprising storage circuits receptive of said signals representative of a time count, latch control means to control storage of said time count signals to cause said device to function as a stop-watch means, display means for displaying a time count when said device functions as a stop-watch and as a timepiece and in which said time count start-stop means develops a signal output maintaining said counting means in a counting state, and includes counting means for controlling the content of a time count of said counting means comprising reset means for generating a reset output signal applied to said counters and gate means receiving a signal from said counting start-stop

means and said reset output signal from said reset means rendering the reset output signal ineffective when said time count start-stop means develops said output signal thereof for maintaining said counting means in said counting state.

3,854,278

ELECTRONIC WRIST WATCH DISPLAY

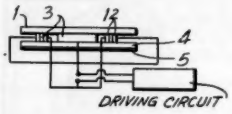
Hiroshi Takeshita, and Katsuhito Teraishi, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 27, 1972, Ser. No. 319,069

Claims priority, application Japan, Dec. 27, 1971, 46-2868; Dec. 28, 1971, 46-2751

Int. Cl. G04b *19/30;* **H05b** *39/09*

U.S. Cl. 58—50 R **8 Claims**



1. A timepiece display device for digital display of the time comprising a polarizer plate for circularly polarizing light incident thereon and passing therethrough, a reflector plate opposed to said polarizer plate and means intermediate said opposed plates for controllably retarding said light passing between said opposed polarizer and reflector plates, said means being activatable for controlling the retardation of said light by selective impositions of a suitable voltage to at least a portion of said means, substantially no light reflected from said reflector plate being transmitted through said polarizer plate in the absence of a voltage applied to said means.

3,854,279

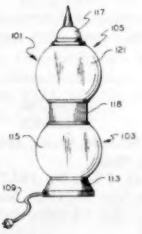
METHOD AND APPARATUS FOR INDICATING TIME IN TERMS OF COLOR

Frank L. Edmunds, 615 W. Onondaga St., Syracuse, N.Y. 13202

Filed Feb. 4, 1974, Ser. No. 439,354

Int. Cl. G04b *19/00*

U.S. Cl. 58—50 R **6 Claims**



1. Apparatus for indicating time in terms of color, said apparatus comprising:

a first plurality of differently colored electric lamps, each lamp having a color corresponding to particular hours of the day;

a first container having a chamber for holding said first plurality of electric lamps, said container transmitting light from the colored lamps when the lamps are ignited;

first switching means for connecting said lamps to an electric power source in hourly sequence to ignite each lamp in turn according to the hour of the day to which the color of each lamp corresponds;

a second plurality of differently colored electric lamps, each lamp having a color corresponding to a particular part of each hour of the day;

a second container having a chamber for holding said second plurality of electric lamps, said container transmitting light from the colored lamps when the lamps are ignited; and

second switching means for connecting said second plurality of lamps to an electric power supply in timed sequence to ignite each lamp in turn for the period of the hour of the day to which the color of each lamp corresponds.

3,854,280

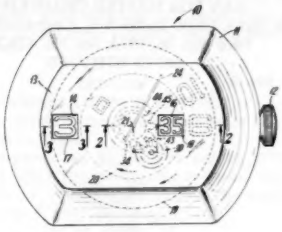
MECHANICAL DIGITAL WATCH

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Watertown, Conn.

Filed June 10, 1974, Ser. No. 477,731

Int. Cl. G04b *19/02, 19/00*

U.S. Cl. 58—125 B **10 Claims**



1. A digital watch having an outer case and watch drive means located therein comprising:

a dial mounted to said case and having at least one window therein,

a drive shaft coupled to the watch drive means and having a seconds hand mounted thereon,

a minute disc coupled to said shaft and having indicia located on the periphery thereof for indicating minutes, said indicia being viewable through said window in the dial,

an hour disc concentrically coupled to said drive shaft and having hour indicia located about the periphery thereof, said indicia being viewable through said window in the dial, said hour disc having a disc gear portion extending therefrom,

a cannon pinion coupled to said drive shaft and having a protruding nose portion on the periphery thereof, and,

a pinion hour drive assembly comprising a Geneva drive pinion actuated each hour by said cannon pinion and a pinion gear portion which engages the hour disc gear to drive said gear during a relatively short interval at the turn of each hour thereby rapidly changing the hour indicia in said window.

3,854,281

HOURMETER FOR EQUIPMENT HAVING SHORT OPERATING TIMES

Heinz Reichert, Neviges, Germany, assignor to Eaton Corporation, Cleveland, Ohio

Filed Sept. 26, 1973, Ser. No. 401,013

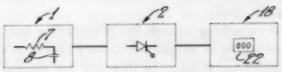
Claims priority, application Germany, Jan. 31, 1973, 2304479

Int. Cl. G04f *9/06;* **G04b** *5/20*

U.S. Cl. 58—145 R **11 Claims**

1. An hourmeter for indicating the operating time of electrical equipment having short and intermittent operating cycles during which an electrical signal is produced comprising:

Storage means connectable to the electrical equipment for accumulating to a predetermined level the electrical signal produced by the electrical equipment during the operating cycles;



switching means for providing a control signal in response to said storage means accumulating to said predetermined level the electrical signal from the electrical equipment; and

indicating means responsive to said control signal from said switching means to provide an indication of the operating time of the electrical equipment.

3,854,282

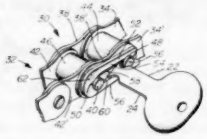
KEY FOR MASTER CHAIN LINK

Carlman Mazel, 10606 Jordan Ave., Chatsworth, Calif. 91311

Filed Dec. 26, 1973, Ser. No. 428,213

Int. Cl. B21l *21/00*

U.S. Cl. 59—7 **3 Claims**



1. A key for removing the clip on a master link wherein the clip is generally U-shaped having two arms with the closed end of clip at the joined end of the arms engaging a groove in and adjacent the end of one cross pin and the open end of the clip at the free end of the arms engaging a groove in and adjacent the end of another cross pin, comprising,

a shank having a handle at one end,

said shank being wider in one direction than the gap between the arms when the free ends of the arms engage the groove in the other pin and spreading the arms when the width of the shank lies perpendicular to said arms so that the free end of at least one arm disengages the groove in said other pin,

and at least one cam surface in the shank immediately adjacent the other end for engaging one of said arms and lifting it beyond the end of said other pin when the width of the shank is turned between the arms to a plane perpendicular to the pins.

3,854,283

INTERNAL COMBUSTION STEAM GENERATING SYSTEM

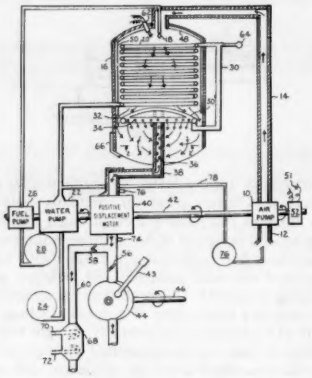
Robert L. Stirling, 108 Edgar Ave., Brookhaven, N.Y. 11719

Filed Oct. 25, 1973, Ser. No. 409,695

Int. Cl. F02c *7/02*

U.S. Cl. 60—39.17 **10 Claims**

1. An energy conversion arrangement, comprising in combination, a combustion chamber; a source of compressed air connected to said chamber; a source of fuel connected to said chamber and mixed with said compressed air for combustion; a source of water and containing means in said chamber for receiving water to be converted into steam by the combustion of said fuel and air, said containing means isolating said water from contact with the interior of said combustion chamber and from contact with the products of combustion, said steam being released from said container means and passed into the interior of said chamber for intermixing with the products of combustion within said chamber; ring-shaped means for distributing said steam about the interior of said chamber for intermixing substantially uniformly with the products of combustion; first conversion means connected to the output of said chamber for receiving the mixture of steam and products of combustion and converting partially the energy thereof into mechanical energy; means interconnecting said first conversion means with said sources of compressed air, fuel and water whereby all said sources are operated simultaneously with the operation of said first conversion means; second conversion means connected to said first conversion means for converting into mechanical energy the remaining available energy of said



steam and products of combustion from said first conversion means; and valve means between said first and second conversion means, said first and second conversion means being operated when said valve means is in open position, said first and second conversion means being held stationary in inoperative position when said valve is in closed position, said mixture of steam and products of combustion having a substantially constant energy content for a predetermined time interval during which said first and second conversion means are in inoperative position with said valve in closed position, said mixture of steam and products of combustion transferring energy to said first and second conversion means upon return of said valve means to said open position from said closed position.

3,854,284

ENGINES

James M. Denker, Scituate, Mass., assignor to Nutron Corporation, Hingham, Mass.

Continuation-in-part of Ser. No. 185,727, Oct. 1, 1971. This application Apr. 25, 1973, Ser. No. 354,209

Int. Cl. F02g *3/00*

U.S. Cl. 60—39.61 **24 Claims**

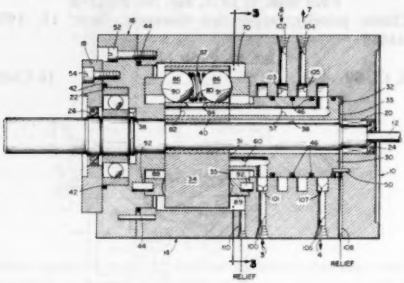
1. An engine having an inlet port and an exhaust port and comprising:

a rotary piston support defining a piston bore, a porting surface, and a conduit extending from said bore to a port at said porting surface;

a cam defining a generally annular cam surface of $2n$ cycles, said cycles being arranged in n sets each of two cycles, one cycle of each set being adjacent and having a displacement greater than that of the other cycle of said each set, and said cam and said piston support being relatively rotatable,

a piston mounted in said bore for movement relative to said support and engaging said cam surface;

a manifold fixed with respect to said cam and having a porting surface engaging said support porting surface, said manifold porting surface defining a plurality of ports, each of said cycles having at least one of said manifold ports associated therewith, said manifold ports being arranged such that during the respective predetermined portions of the relative rotation of said manifold and said support that said piston engages each said cycle said port at said support porting surface communicates with said one manifold port associated with said each cycle, and said manifold and said support being relatively movable; a power chamber including means for increasing the internal energy of a gaseous fluid therein;



a first conduit communicating with said inlet port and a first one of said manifold porting surface ports and providing for intake flow of fluid from said inlet port through said first one port to said bore;

a second conduit communicating with said power chamber and a second one of said manifold porting surface ports and providing for flow of fluid from said bore through said second one port to said power chamber;

a third conduit communicating with said power chamber and a third one of said manifold ports and providing for flow of fluid from said power chamber through said third one port to said bore; and,

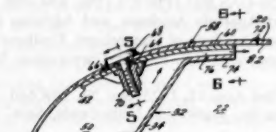
a fourth conduit communicating with a fourth one of said manifold ports and said exhaust port and providing for exhaust of fluid from said bore through said fourth one port to said exhaust port.

3,854,285

COMBUSTOR DOME ASSEMBLY

Richard E. Stenger; Arthur J. Gardella, and Thomas C. Campbell, all of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 26, 1973, Ser. No. 335,684
Int. Cl. F02c *7/18*
U.S. Cl. 60—39.66 **8 Claims**



1. In a combustor assembly including a pair of combustor liners radially spaced from one another and adapted to form a combustion zone therebetween, a dome assembly adapted to be positioned between said liners and to cooperate therewith to form the upstream end of said combustion zone, and a pair of snout rings adapted to surround said dome assembly and to define an inlet plenum upstream of said combustion zone, the improvement comprising:

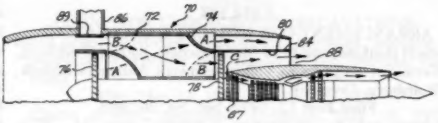
said dome assembly includes a dome plate having an upstream end, a downstream end, which forms a generally annular-shaped opening which lies in fluid flow communication with said combustion zone, and at least one mounting ring extending from said downstream end of said dome plate, said mounting ring includes means for removably connecting said dome plate to at least one of said liners, wherein said connecting means are characterized in that they are positioned completely outside of said combustion zone, and wherein said mounting ring includes means for delivering a coolant from said inlet plenum to the inner side of at least one of said liners as a substantially uniform circumferential film at the intersection of said dome assembly and said liner wherein said connecting means comprise a plurality of bolts at least a portion of which extend into said inlet plenum upstream of said coolant delivery means such that said bolts do not interfer with said coolant film, and said mounting ring includes a wiggle strip connected to said dome plate in such a manner as to surround said dome plate at said intersection of said dome assembly and said liner.

3,854,286

VARIABLE BYPASS ENGINES

Garry W. Klees, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 226,850, Feb. 16, 1972, Pat. No. 3,792,584, which is a continuation-in-part of Ser. No. 196,422, Nov. 8, 1971, Pat. No. 3,779,282. This application Feb. 5, 1973, Ser. No. 329,768
Int. Cl. F02k *3/04*
U.S. Cl. 60—204 **12 Claims**



1. A turbine engine having a centrally located housing containing a core gas generator, and a fluid flow control system located between a forward blade element and an aft blade element of said engine; said flow control system comprising means for inverting the respective positions of two separate adjacent annular flow patterns between the entrance and exit ends of said system, means for switching the respective positions of said two flow patterns from their inverted positions to the same respective positions at each of said entrance and exit ends; and wherein there is additionally included in said engine a core passageway means for supplying intake air to said core gas generator which provides a flow path not affected by flow in said two separate flow patterns.

3,854,287

SELF-TRIMMING CONTROL FOR TURBOFAN ENGINES

John P. Rembold, Juno Isles, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 26, 1973, Ser. No. 427,754
Int. Cl. F02c *3/06, 9/04;* **F02k** *3/06*
U.S. Cl. 60—236 **8 Claims**

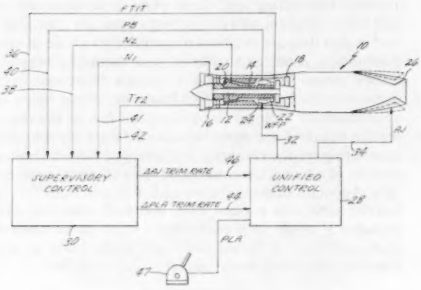
1. In a control for a twin spool turbine engine having an inlet, a low pressure rotor and a high pressure rotor each having a turbine driven compressor, a burner to which fuel is supplied for driving said turbines, and a variable area exhaust nozzle,

means responsive to selected engine operating conditions for maintaining a desired relationship between parame-

ters of low pressure turbine inlet temperature and high pressure compressor speed including means for generating a first signal indicative of a scheduled operating limit for one of said parameters,

means responsive to selected engine operating conditions for generating a second signal indicative of a reference value for the other of said parameters,

means for measuring the actual value of said other parameter and producing a third signal indicative thereof,



means for comparing said second and third signals and producing therefrom an error signal proportional to the difference therebetween,

means responsive to said error signal for scheduling a trim signal,

means for adding said trim signal to said first signal to produce a fourth signal indicative of the desired value of said one parameter,

and means for trimming the flow of fuel to said burner in response to said fourth signal.

3,854,288

ARRANGEMENT FOR EXHAUST GAS CLEANING

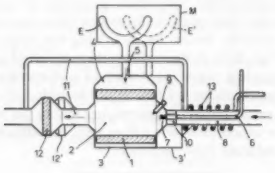
Herbert Heitland, and Peter Manderscheid, both of Wolfsburg, Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed June 12, 1972, Ser. No. 262,008

Claims priority, application Germany, June 11, 1971, 2129023

Int. Cl. F01n *3/14*; **F02b** *75/10*

U.S. Cl. 60—300 **9 Claims**



1. A combustion engine emitting an exhaust gas in the process of its operation comprising a cleaning arrangement for cleaning the exhaust gas, said cleaning arrangement comprising a thermal reactor for oxidizing the components in the exhaust gas and a first catalyzer placed upstream with respect to the flow of exhaust gases before the thermal reactor for performing a reduction of the components in the exhaust gas, said first catalyzer comprising a hollow body surrounding said thermal reactor, a housing for receiving said first catalyzer and said thermal reactor, said first catalyzer forming with said housing a chamber, and an input conduit for the exhaust gases terminating in said chamber, said thermal reactor comprising a heating arrangement including a fuel supply, a secondary air supply and sparkplug means for igniting the fuel and air mixture supply to said thermal reactor, said heating arrangement being placed adjacent an end wall portion of said housing into which said thermal reactor and said first catalyzer are placed, said housing comprising another end wall portion including an exhaust gas output conduit.

3,854,289

HYDRAULIC CONTROL APPARATUS FOR ENDGATES OF TRUCKS OR THE LIKE

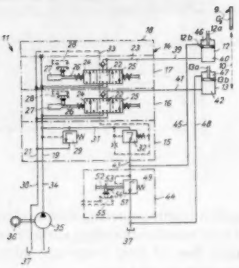
Walter Herrmann, Vaihingen/Enz; Heinrich Geisler, Gerlingen, and Friedrich-Wilhelm Hofer, Hofingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 7, 1973, Ser. No. 395,372

Claims priority, application Germany, Sept. 11, 1972, 2244445

Int. Cl. F15b *11/16*

U.S. Cl. 60—423 **16 Claims**



1. In a hydraulic control apparatus for at least one double-acting consumer wherein at least one control valve includes at least one valve member movable between first operative, second operative and neutral positions to thereby respectively connect a first fluid-conveying line of said consumer with a supply conduit which is connected to a source of pressurized fluid, with a return conduit which is connected to a tank, and to seal said first line from said conduits, and wherein said valve member regulates the flow of fluid in a control conduit for a switchover valve which opens in response to fluid flow in said control conduit to thereby provide a path for the flow of pressurized fluid in an additional conduit connecting said source to said tank, the improvement which consists in the provision of auxiliary valve means installed in said additional conduit between said tank and said switchover valve to regulate the pressure of fluid in a second fluid-conveying line which connects said consumer with said additional conduit between said switchover valve and said auxiliary valve means.

3,854,290

HOT-GAS RECIPROCATING ENGINE

George Albert Apolonia Asselman, and Adrianus Petrus Johannes Castelijns, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Aug. 15, 1973, Ser. No. 388,440

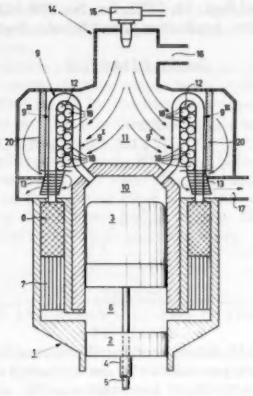
Claims priority, application Netherlands, Sept. 13, 1972, 7212380

Int. Cl. F01k *27/00*

U.S. Cl. 60—524 **7 Claims**

1. In a hot-gas reciprocating engine including a heater as a heat exchanger for exchanging heat between combustion gases and a working medium present in the engine, the improvement in combination therewith wherein said heater comprises at least two inner and outer rows of pipes, the rows of pipes being spaced apart in the direction of the gas flow thus forming an intermediate space between the rows, with

passages for the combustion gases present between the pipes of each row, said heater further comprising within said inter-

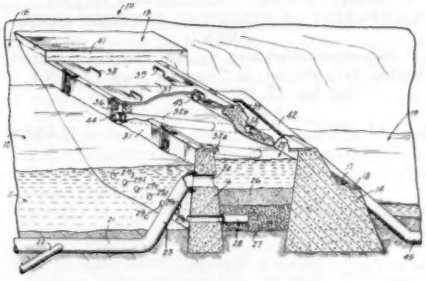


mediate space a mass of hollow spherical elements which elements are readily heat-radiant during operation of the engine and between which the combustion gases can flow.

3,854,291
SELF-CLEANING FILTER FOR HYDROLOGICAL REGENERATION

Earl Stuart Perkins, 3207 York Rd., Oak Brook, Ill. 60521

Filed Dec. 26, 1972, Ser. No. 318,099
Int. Cl. E02b *8/02*
U.S. Cl. 61—2 **6 Claims**

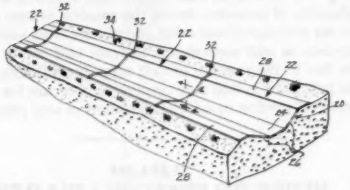


1. A system for purifying streams, comprising a dam installed across the river bed of the streams to form a holding pool above the dam, a filter chamber formed in the dam, an inlet sewer pipe sealed from the holding pool connected to the dam to supply input fluid to said filter chamber, filter outlet means extending from the bottom of said filter chamber into said holding pool to normally supply filtered fluid into said holding pool, including pass-through conduit means extending from said holding pool to downstream of said dam and positioned so that the normal head in said holding pool is less than in said filter chamber, including valve means connected to said pass-through conduit means and normally open and adapted to close when the level of said holding pool rises above a preset level, and including a spill way formed in the dam and the elevation of the spill way above the head in said filter such that the filter is backwashed and cleaned by fluid passing from said holding pool through said filter outlet means to said filter.

3,854,292
IRRIGATION DITCH LINER AND METHOD FOR MAKING SAME

Hans Nienstadt, P.O. Box 6565, Caracas, Venezuela

Filed Sept. 30, 1971, Ser. No. 185,165
Int. Cl. E02b *5/02*
U.S. Cl. 61—7 **4 Claims**

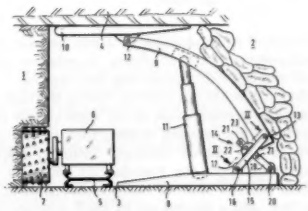


1. A liner for use in a channel such as an irrigation ditch comprising a plurality of prefabricated sections laid end to end in a channel conformably supporting the same, each of said sections being formed of fiber reinforced plastic resin of predetermined characteristics and being concave upwards, each section having fibers initially extending from the opposite ends thereof with the extending fibers of successive sections in overlapping relation providing a double layer of fibers, and plastic resin of said predetermined characteristics cured to set in place over said overlapping fibers and thus forming with the compatible plastic resin of adjacent sections a continuous integral liner with reinforced integral areas between adjacent sections; certain spaced sections along the length of the liner being of a plastic resin of different characteristics rendering the same flexible as compared to remaining sections for accommodating shifting of the said remaining sections.

3,854,293
LINING FOR UNDERGROUND EXCAVATIONS

Klaus Spies, Dortmund-Wellinghofen, Germany, assignor to Bochumer Eisenhutte Heintzmann & Co., Bochum, Germany

Filed May 18, 1973, Ser. No. 361,643
Claims priority, application Germany, May 18, 1972, 2224207
Int. Cl. E21d *15/44*
U.S. Cl. 61—45 D **15 Claims**



1. In a lining for underground excavations, a combination comprising a floor base having two spaced sides; a shield comprising at least one part which extends over said floor base in direction from one toward the other of said sides and has a free end portion, and an other end portion spaced from said free end portion in said direction; a roof cap attached to said free end portion of said shield and projecting beyond the same; at least one pit prop arranged between and engaging said floor base and said shield and being extendable so as to adjustably support said shield and said roof cap on said floor base; a bracket attached to said floor base and provided with an elongated cam opening; and an adjustable support assembly comprising a first pivot supported in said cam opening for

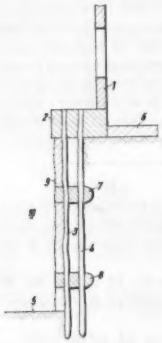
displacement longitudinally thereof, a support mounted for rotation about and displacement together with said first pivot relative to said floor base and having a floor base portion of an eccentric cylindrical configuration abutting against said floor base and subjecting said first pin to displacement longitudinally of said cam opening during the rotation of said support, a second pivot engaging said other end portion of said shield so as to subject said other end portion to displacement along an arcuate path extending in said direction and through a plurality of positions during the rotation of said support so that the distance of said other end portion from said floor base increases as said support rotates from said one to said other side due to the rotation of said support and displacement of said first pivot in said cam opening, and means for fixing said other end portion in selected positions of said plurality.

3,854,294

METHOD FOR PRODUCING A PILE SUPPORT ARRANGEMENT

Anton Frank, Kololdstrasse 37, 8000 Munich 83, Germany

Filed Dec. 29, 1972, Ser. No. 319,398
Int. Cl. E02d *27/48, 5/36*
U.S. Cl. 61—51 **10 Claims**



1. A method of production of a pile support arrangement for underpinning the pre-existing foundation of a building structure and the like, comprising the steps of:

installing a plurality of piles by boring through the foundations into ground so as to be supportively disposed beneath the pre-existing foundations of the structure to form a first set of vertically installed piles stretching longitudinally of the foundations and with a predetermined number thereof being installed at angles to one another, and a second set of piles installed obliquely to said first set in a non-vertical direction, and stretching longitudinally of the foundations;

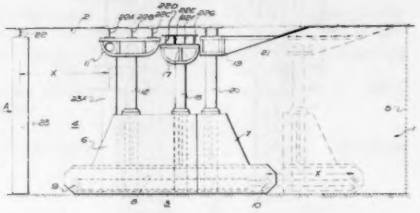
injecting concrete material at selected positions between the driven piles to form hardened nodes within the ground connecting at least respective ones of the piles together at said selected positions whereby a trussed grid-structure comprising an array of interconnected rigid triangular structural portions, is developed throughout said plurality of piles to form said pile support arrangement which is capable of absorbing vertical and oblique forces applied thereto and transmitting same to ground, in which the step of injecting concrete material is selected at positions within the driven piles to form rigid triangular pile structures in the direction of continuous footings.

3,854,295

MINING EQUIPMENT

Charles Round, Rotherham, England, assignor to Fletcher Sutcliffe Wild Limited and Charles Round

Filed Sept. 10, 1973, Ser. No. 395,543
Claims priority, application Great Britain, Sept. 19, 1972, 43245/72
Int. Cl. F21d *15/58*
U.S. Cl. 61—63 **9 Claims**



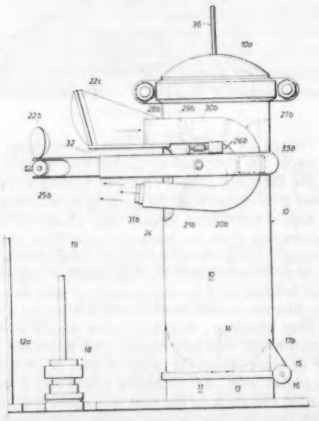
1. A machine for setting permanent mine-roadway supports, each support being constituted by one horizontal roof bar and two spaced apart vertical legs, said machine comprising a canopy adapted to carry a horizontal roof bar of a permanent mine roadway support to be set in position by the machine, hydraulic displacement means for advancing said canopy towards a roof of a roadway or for retracting said canopy from said roof of said roadway, and at least one hydraulic ram carried by, or supported from, said canopy and adapted, in use, to act directly below said roof bar to be set and on upper ends of said two vertical legs which complete the permanent mine roadway support, by displacing said upper ends of said legs from an inclined position to a set position in which both said legs engage said roof bar advanced by said canopy to said roof.

3,854,296

SUBSURFACE WORK CHAMBER FOR MAKING TRANSPARENT AN UNDERWATER CLOUDY WORK AREA

Ivo C. Pogonowski, Blackburg, Va., and Paul D. Carmichael, Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 27, 1973, Ser. No. 355,115
Int. Cl. B63c *11/00*
U.S. Cl. 61—69 R **12 Claims**



1. A subsurface well servicing and life supporting work chamber for housing workers and wellhead equipment for

operating in an underwater area covered with cloudy water comprising,

a. submarine chamber means,

b. water filter means including water inlet means and pump means for said submarine chamber means for drawing in cloudy water and filtering said cloudy water to provide clear water,

c. water ejection means for said submarine chamber means,

d. said water ejection means being responsive to said water filter means for ejecting clear water over said underwater area for providing a relatively transparent area of clear water to work in, and

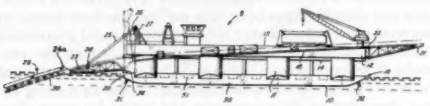
e. baffle plate means being positioned between said water inlet means and said water ejection means for limiting mixing of the ejecting clean and clear water with the incoming cloudy water and to increase the size of work area swept by the clean and clear water.

3,854,297

METHOD AND APPARATUS FOR LAYING MARINE PIPELINES

Douglas E. Broussard; Dean P. Hemphill, both of Houston; Robert H. Kolb, Cypress, all of Tex., and Robert H. Macy, Pascaqoula, Miss., assignors to Shell Oil Company, New York, N.Y.

Filed Nov. 9, 1970, Ser. No. 87,667
Int. Cl. B63b *35/04*; **F16l** *1/00*
U.S. Cl. 61—72.3 **6 Claims**



1. A semi-submersible vessel for carrying out offshore operations comprising:

a single, hollow, water-tight barge-shaped hull member;

a plurality of open-top ballast pen means supported on the upper surface of the barge hull member for temporarily holding water as a wave moves across said barge hull;

a number of water-tight selectively floodable buoyancy control chambers within said barge hull;

pumping means in fluid communication with said buoyancy control chambers adapted to selectively flood and evacuate said chambers thereby varying the buoyancy of said vessel in said body of water;

a plurality of vertically extending buoyant stabilizing columns supported on the upper surfaces of said hull and spaced longitudinally thereon; and

work platform means supported at the upper ends of said columns for accomodating equipment for said offshore operations.

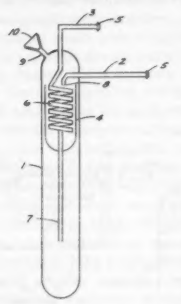
3,854,298

CONDENSATE TRAP

D. Charles Carter, Dayton, Ohio, assignor to Monsanto Research Corporation, St. Louis, Mo.

Filed July 23, 1973, Ser. No. 381,945
Int. Cl. B01d *5/00*
U.S. Cl. 62—55.5 **3 Claims**

1. A device for condensing vapors from gaseous streams which comprises an elongated generally tubular container containing an inlet tube and an outlet tube, a cup member disposed within said container in spaced relationship to the inner surface of said container, an open-ended dip tube projecting downward through the bottom of said cup member and terminating within said container beneath said cup member, a tubular coil disposed within said cup member and communicating through one end thereof with said dip tube and through the other end thereof with said outlet tube, said inlet tube



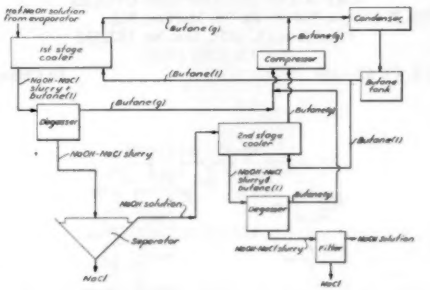
projecting through a wall of said container and terminating within said cup member near said coil.

3,854,299

COOLING CONCENTRATED, DIAPHRAGM CELL SODIUM HYDROXIDE SOLUTIONS

Harold D. Myers, and William G. Moore, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 27, 1971, Ser. No. 192,941
Int. Cl. B01d *9/04*
U.S. Cl. 62—58 **24 Claims**



1. A process to reduce the sodium chloride concentration in a sodium hydroxide solution which comprises:

a. cooling a hot, concentrated, diaphragm cell sodium hydroxide solution containing sodium chloride by contact with a liquid refrigerant, whereby sodium chloride is precipitated; and

b. separating the precipitated sodium chloride from the sodium hydroxide solution.

3,854,300

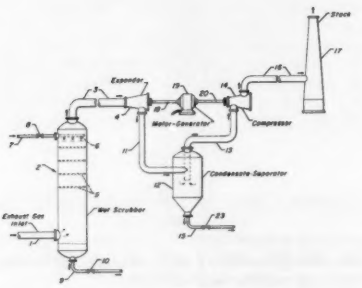
WATER VAPOR REMOVAL FROM VENT GAS SYSTEMS

Clarence G. Gerhold, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 8, 1973, Ser. No. 368,419
Int. Cl. F25b *9/00*
U.S. Cl. 62—88 **2 Claims**

1. In the scrubbing of waste gases with aqueous liquid to remove pollutants therefrom, thereby forming a scrubbed gas stream of high moisture content such that an objectionable visible plume of water vapor is formed upon discharge of the gas stream to the atmosphere through a stack, the method of minimizing said visible plume from the stack which comprises

expanding said scrubbed gas stream of high moisture content to a lower pressure such as to effect cooling and resulting water vapor condensation, separating resulting water condensate from the gas stream, recompressing the cooled gas stream



with retained latent heat of vaporization and thereby further heating said stream, and then discharging the resulting heated stream with the lowered moisture content through said stack to the atmosphere.

3,854,301

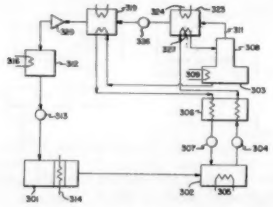
CRYOGENIC ABSORPTION CYCLES

Ellis P. Cytryn, 900 W. Rt. 70, Marlton, N.J.

Filed June 11, 1971, Ser. No. 152,332

Int. Cl. F25b *15/00*

U.S. Cl. 62—101 **10 Claims**



1. A refrigeration process comprising the steps of:

absorbing a refrigerant vapor in a liquid absorbent;

increasing the pressure on resultant mixture of said refrigerant and said absorbent;

distilling and rectifying the mixture into substantially pure refrigerant vapor and pure absorbent;

reducing the pressure on resultant pure liquid absorbent and returning the latter to the absorbing step;

cooling and condensing the refrigerant vapor to the liquid state;

reducing the pressure upon the liquid refrigerant to below the triple point of the refrigerant to produce solid refrigerant;

sublimating the solid refrigerant to the vapor state; and

passing resultant refrigerant vapor to the absorbing step at a rate that maintains the pressure below the triple point.

3,854,302

DEFROSTER FOR A REFRIGERATING SYSTEM

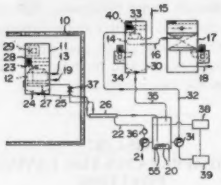
Fujio Masuda, Tokyo, Japan, assignor to Sakura Refrigerating & Heating Engineering Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 288,666, Sept. 13, 1972, Pat. No. 3,772,897. This application Aug. 29, 1973, Ser. No. 392,748

Claims priority, application Japan, Apr. 14, 1973, 48-42601

Int. Cl. F25d *21/10*

U.S. Cl. 62—282 **10 Claims**



1. A defroster for removing the frost deposited on the surface of the evaporator of a refrigerating system which comprises spray means for spraying an antifreezing solution on the evaporator to remove the frost deposited on the evaporator; an antifreezing solution tray positioned below the evaporator so as to receive the antifreezing solution sprayed on the evaporator and dripping therefrom after melting the frost deposited thereon; a precooler located between the tray and evaporator to cause the antifreezing solution passing through the precooler to be cooled from the outside by a separate portion of the antifreezing solution which has been cooled by melting the frost deposited on the evaporator; and means for conducting the antifreezing solution collected in the tray to the spray means through the precooler, whereby the antifreezing solution flowing through the precooler is precooled from the outside by a separate portion of the antifreezing solution which has been cooled by melting the frost deposited on the evaporator and thereafter being sprayed again on the evaporator by the spray means.

3,854,303

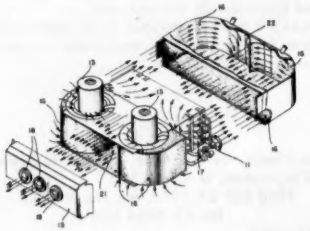
AIR-CONDITIONING SYSTEM FOR MOTOR VEHICLES

Luis Suchard, 2332 Portland St., Los Angeles, Calif. 90007

Filed Nov. 3, 1972, Ser. No. 303,596

Int. Cl. F25d *17/06*

U.S. Cl. 62—426 **2 Claims**



1. An air conditioning system for vehicles comprising:

an outer casing having an open front end;

an inner casing disposed within said outer casing and spaced therefrom, said space defining an air flow path therebetween;

cooling coils disposed within said inner casing and partially extending into said air flow path;

a face plate disposed in and covering said front end; circulation means disposed within said outer casing and adjacent said inner casing for drawing uncooled air into said air flow path to reduce the heat and moisture content of said air, and for forcing the drier cooler air across the cooling coils for additional temperature reduction;

means for insulating the interior surfaces of said outer casing and said face plate; and

louver members provided on said face plate and adapted to permit the directed explusion of cooled air therefrom into the surrounding atmosphere.

3,854,304

MULTI-SYSTEM CIRCULAR KNITTING MACHING HAVING A PATTERN DEVICE

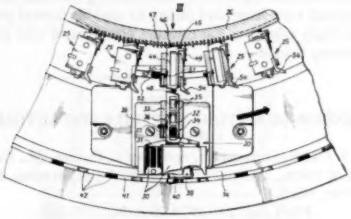
Gerhard Hamma, Spaichlingen, Germany, assignor to Mayer & Cie. Maschinenfabrik, Tailfingen/Wuertt, Germany

Filed Feb. 5, 1973, Ser. No. 329,424

Claims priority, application Germany, Feb. 8, 1972, 2205750

Int. Cl. D04b *15/78*

U.S. Cl. 66—50 R **3 Claims**



1. In a multi-system circular knitting machine having a rotating needle cylinder provided with a plurality of guide grooves and a stationary cam cylinder and a plurality of cylinder needles and jacks reciprocally movably mounted in said guide grooves, an improved device for producing a knitted fabric, comprising in combination,

a plurality of equidistantly mounted means for supporting sets of non-rating sliding members, each non-rotating sliding member being slidable in its supporting means to assume a radially inward operative position and a radially outward inoperative position, said sliding members when in their operative positions being adapted to engage preselected ones of said plurality of jacks, whereby each set of sliding members corresponds to a knitting system of the multi-system knitting machines;

means for supporting a single set of positioning members, said supporting means being rotatable in the circular knitting machine synchronously with said needle cylinder and each positioning member of said set of positioning members being movable from an inoperative position to an operative position wherein it is adapted to coact with preselected sliding members of all sets of said non-rotating sliding members so as to position said preselected sliding members into their operative position by slidingly moving them radially inwards;

a control cam mounted on said means for supporting said positioning members, said control cam coacting with all sets of non-rotating sliding members to lock the sliding members of each set in place at predetermined time intervals;

each one of said means for supporting sets of non-rotating sliding members comprises a stationary cam member which coacts with those positioning members of said set of positioning members which are in their operative position to return them to their inoperative position when said rotating means for supporting positioning members passes by said stationary cam member;

a set of holding magnets corresponding to the number of positioning members and mounted on the same means which support said positioning members, each positioning member is adapted to coact with a holding magnet; and a pattern program storage device electrically connected to each holding magnet for selectively energizing it to thereby release the corresponding positioning member; wherein each of said means for supporting sets of non-rotating sliding members comprises a first locking mechanism adapted to coact with said control cam so as to lock preselected non-rotating sliding members in each set into their operative or inoperative positions, and wherein said means for supporting said single set of positioning members comprises a second locking mechanism, an annular stationary control cam mounted in the circular knitting machine, said second locking mechanism being adapted to coact with said annular control cam so as to lock preselected positioning members in their operative or inoperative positions.

3,854,305

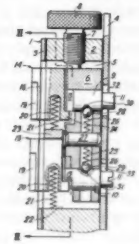
ADJUSTABLE STITCH CAM

Rudolf Bandoch, Bilovice, and Karel Sodomka, Brno, both of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Switzerland

Filed Sept. 8, 1972, Ser. No. 287,427

Int. Cl. D04b *15/32*

U.S. Cl. 66—54 **4 Claims**



1. An arrangement for adjusting stitch cams in circular knitting machines, comprising in combination,

a cam box having a front plate and a back plate each having at least one opening, said plates defining a space therebetween, and having a top plate and a bottom plate;

a member having at least two transverse bores is movably mounted in said space;

a corresponding number of stitch cam setting pins adjustably mounted in said transverse bores;

a corresponding number of stitch cams adjustably mounted in said cam box and being adapted to coact with said setting pins;

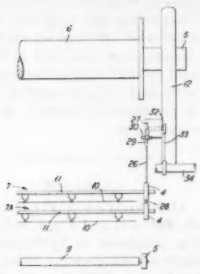
screw means threadably mounted in said top plate and extending into said space so as to contact said member; biasing means disposed in said cam box and urging said member into contact with said screw means;

the position of said member including the setting pins relative to the distance from the top and bottom plates is adjustable by said screw means, whereby an adjustment of each stitch cam can be made via the coacting setting pin provided the corresponding setting pin is in its operative position, said stitch cams being individually settable into operative or inoperative position by the turning of said setting pins.

3,854,306
KNITTING MACHINES AND LIKE FABRIC-PRODUCING MACHINES

Jack Heywood, and Roger Heywood, both of Rochdale, England, assignors to Meiners Optical Devices Limited, London, England

Filed Sept. 11, 1972, Ser. No. 287,807
Claims priority, application Great Britain, Sept. 16, 1971, 43330/71; Mar. 27, 1972, 14341/71
Int. Cl. D04b *23/00*
U.S. Cl. 66—86 A **14 Claims**



1. Yarn handling and control apparatus in a knitting machine, including at least one warp beam supplying warp yarns, yarn length control means over which warp yarn supplied by said at least one warp beam pass, a row of knitting elements to which said warp yarns travel after passing over said yarn length control means, said warp yarns extending from said yarn length control means to said knitting elements in close mutually parallel relationship and all in a common plane so as to form a yarn sheet, a fabric take-up roller receiving fabric knitted by said knitting elements, said yarn length control means comprising a wholly rigid coupling including a rigid tension bar extending parallel to said yarn sheet plane and at right angles to the direction of travel of said yarns, said tension bar being mounted for only rigidly controlled oscillation to and fro in a direction toward and away from said yarns, power-actuated drive means oscillating said tension bar rigidly in said a direction in synchronism with the operation of said knitting elements, and means automatically responsive to stopping and starting of said machine to vary the stroke of oscillation of said tension bar such that said bar is driven farther in the direction toward said yarns on stopping and withdrawn in the direction away from said yarns through an equivalent distance on starting of such extent as to create an excess of warp yarn length on stopping, and means for progressively reducing said warp yarn length under controlled tension in response to restarting of said machine.

3,854,307
DRIVE MEANS FOR POSITIVE YARN FEEDING DEVICES MOUNTED ON A CIRCULAR KNITTING MACHINE

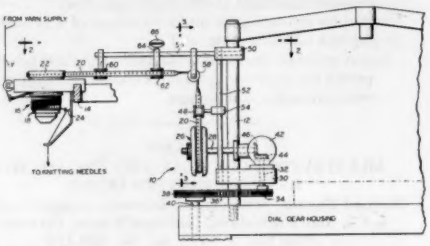
John Seibold, Ronkonkoma, N.Y., assignor to Wesco Industries Corp., Plainview, N.Y.

Filed Apr. 16, 1973, Ser. No. 351,567
Int. Cl. D04b *15/48*
U.S. Cl. 66—132 T **8 Claims**

1. In a circular knitting machine equipped with a plurality of positive yarn feeding devices, each having a rotating element mounted for rotation about a vertical axis and said rotating elements being mounted at the same elevation whereby to be driven by a single endless tape adapted to travel in a horizontal path for drivingly engaging said rotating elements, means for driving said tape at a speed having a predetermined relation to the rotational speed of the knitting machine, comprising

a. a pulley adapted to drive said tape,

b. means mounting said pulley onto said kn1itting machine for rotation about a horizontal axis disposed below the elevation of said rotating elements whereby the tape travels vertically as it enters into and departs from its engagement with said pulley,



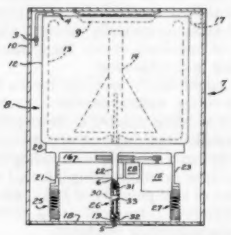
c. shaft means operatively related to said knitting machine drive means for driving said pulley at a speed proportional to the rotational speed of said knitting machine, and

d. idler means supported by said knitting machine for guiding said tape from said pulley to said horizontal path for drivingly engaging the rotating elements of said positive feeding device.

3,854,308
SUSPENSION MOUNTING ASSEMBLY FOR AUTOMATIC WASHER

James I. Czech, Stevensville, and Roy C. Oakley, Jr., Coloma, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 23, 1973, Ser. No. 325,983
Int. Cl. D06f *37/24*
U.S. Cl. 68—23.3 **10 Claims**



1. In a vertical axis automatic washing machine having a cabinet, a cabinet base, and a receptacle assembly within said cabinet, a suspension means for suspending said receptacle assembly above said base, said suspension means comprising: a plurality of essentially identical, vertically oriented helical springs each having the same number of coils;

a plurality of mounting members, one for connecting each of said springs to said receptacle assembly at one end portion of each of said springs, and also for connecting each of said springs to said base at the opposite end portion of each of said springs, said mounting members each having a generally cylindrically shaped surface with a helical groove in said surface of sufficient length to receive engagingly a given number of said spring coils of the one of said springs associated therewith, one of said mounting members as so connected to one end of one of said springs having a longer such groove than at least one other of said mounting members as connected to one end of at least one other respective one of said springs,

whereby said one spring has a different number of free coils and a different spring rate than said at least one other respective one of said springs;

each of said mounting members which so connects its associated one spring to said base being provided with an extension means projecting interiorly in said associated one spring in radially spaced, adjacent relationship to certain of said spring coils whereby, when a relatively large force tends to move said receptacle assembly horizontally, said spring coils of said associated one spring can contact said extension means.

3,854,309

LETTING-OUT OF HIDES AND SIMILAR MATERIALS

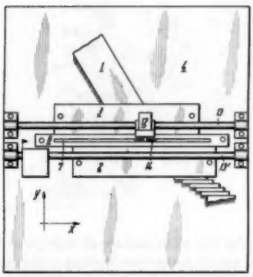
Kurt Rabanus, Grabenstrasse 22, 5608 Radevormwald, Germany

Filed Jan. 30, 1973, Ser. No. 328,007

Claims priority, application Germany, Jan. 31, 1972, 2204399

Int. Cl. C14b *1/40*

U.S. Cl. 69—23 **7 Claims**



1. An apparatus for letting out hides and the like, which comprises a base means disposed to receive the hide to be let-out and having an elongated opening extending along and about a reference cutting line, a first pair of holders operable to grip the hide along two first lengthwise regions disposed in opposite spaced-apart relation about said cutting line, said first pair of holders being movable relative to each other along said cutting line and movable relative to each other along a line transverse to said cutting line; a second pair of holders movable relative to each other and operable to grip the hide along two second lengthwise regions deposed between the cutting line and said first regions, said second pair of holders including a rail which contacts the hide on the hair-free side thereof, and a carriage which contacts the hair side of the hide and has means operable to part the hair of the hide along said cutting line; cutter means operable to sever the hide along said cutting line to form two separate hide parts having confronting edge portions; said first pair of holders being movable one relative to the other along said cutting line to position said hide parts in staggered relation to one another, said first pair of holders being movable one relative to the other along said line transverse to the cutting line to press together the confronting edge portions of said hide parts to accommodate stitching said hide parts together in staggered relation.

3,854,310

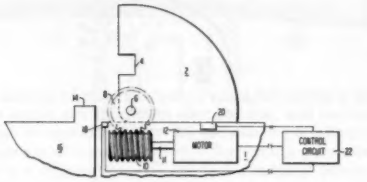
ELECTRIC CONTROL MOTOR DRIVEN LOCK MECHANISM

Stephen Paull, Falls Church, Va., and Paul A. Crafton, Potomac, Md., assignors to Constellation Corporation, Rockville, Md.

Continuation of Ser. No. 216,132, Jan. 7, 1972, abandoned, Division of Ser. No. 84,085, Oct. 26, 1970, abandoned. This application Mar. 7, 1974, Ser. No. 449,134

Int. Cl. E05b *47/00*

U.S. Cl. 70—280 **10 Claims**



1. An electrically controlled motor driven lock mechanism, comprising:

a. a sector bolt rotatable between a locked and an unlocked position,

b. a reversible electric motor having a shaft,

c. a worm connected to the motor shaft,

d. a worm gear driven by the worm and connected to the sector bolt, wherein the gear ratio between the worm and worm gear is such that the worm will only rotate when a rotative force is applied to the motor shaft,

e. a door, wherein said sector bolt is mounted on said door,

f. a door frame for receiving said door, said door frame having a notch means thereon,

g. said sector bolt having a recess means thereon such that when said sector bolt is in a locked position said recess means receives said notch means,

h. a motor current control circuit means for controlling the direction of current through said motor and thereby the direction of rotation of the shaft of said motor;

i. a first logic circuit means having a plurality of AND gates with inverted outputs for generating a first output, said first ouptut being applied to said motor current control circuit means, whereby when said first logic circuit means generates an output said motor current control circuit means causes the rotation of said motor shaft in a direction to cause said sector bolt to rotate to said unlocked position;

j. a second logic circuit means having a plurality of AND gates, with inverted outputs for generating a second output, said second output being applied to said motor current control circuit means, whereby when said second logic cirucit means generates an output, said motor current control circuit means causes the rotation of said motor shaft in a direction to cause said sector bolt to rotate to said locked position;

k. a first sensing means for sensing when said sector bolt is in said unlocked position and for preventing said first logic circuit from generating an output when said unlocked position is sensed;

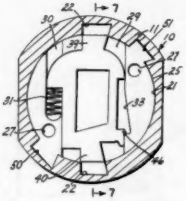
l. a second sensing means for sensing when said sector bolt is in said locked position and for preventing said second logic circuit from generating an output when said sector bolt is in said locked position and,

m. a third sensing means for sensing when said door is not received in said door frame and for preventing said second logic circuit means from generating an output when said door is not received in said door frame.

3,854,311
PICK RESISTANT LOCK HAVING LATERALLY MOVABLE WAFERS

Leonard Mercurio, 34 Beaumont Dr., Plainview, N.Y. 11803

Filed Oct. 29, 1973, Ser. No. 410,428
Int. Cl. E05b *15/14, 29/02*
U.S. Cl. 70—364 R 1 Claim



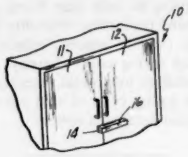
1. In a pick-resistant tumbler lock of a type including a relatively fixed cylinder defining a cylindrical bore, at least one plug element arranged for relative rotation within said bore, said plug element having a resiliently urged wafer slidably mounted thereon for selective projection radially outwardly to engage a corresponding groove in said fixed cylinder, the improvement comprising: said plug element having a radially extending recess therein, said wafer being disposed within said recess, said recess having a generally rectilinear wall at one side thereof, said wafer having corresponding edge surfaces slidably contacting said wall whereby said wafer may execute rectilinear motion relative thereto, said generally rectilinear side wall having a recess therein defining a shoulder, said wafer having a laterally extending surface thereon selectively engageable with said shoulder accompanying a small degree of pivotal motion of said wafer relative to said recess; said wafer defining a generally rectangular opening therein for entrance of a key shank, at least one of the edges defining said opening being disposed in non-rectangular relation to form a camming surface cooperating with a picking tool to urge said wafer into engagement with said shoulder; whereby upon the occurrence of an attempt to pick said lock by exerting a torque upon said plug element relative to said cylinder element, and urging said wafer to a point where said wafer disengages said relatively fixed cylinder, said wafer will be urged to cantered relation relative to the axis of said plug element, and predisposed to enter said recess upon inward movement to engage said shoulder prior to disengagement of said wafer from said fixed cylinder, said cantered relation occurring in the absence of exerting said torque upon the insertion of a picking tool into said plug element, and the contact of said picking tool with said one of said edges defining said opening.

3,854,312
ROTARY LOCK

James J. Van Gompel, Fremont, Ind., assignor to Brammall Inc., Angola, Ind.

Filed Dec. 26, 1973, Ser. No. 428,432
Int. Cl. E05b *35/06*
U.S. Cl. 70—412 14 Claims

1. A lock comprising, a housing, a cylindrical bolt movably mounted in said housing, a transverse pin attached to said bolt, a plurality of locking plates mounted in said housing and formed with openings through which said bolt extends, and a plurality of radial slots formed in said locking plates and arranged so as to be misaligned with each other so that said bolt

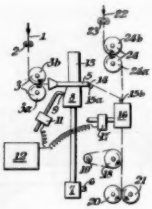


must be angularly displaced relative to its longitudinal axis for said transverse pin to pass through said plurality of radial slots.

3,854,313
PROCESS FOR THE MANUFACTURE OF SLUB YARNS

Norbert Heichlinger, Munich, and Karl Andiel, Bobingen, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Filed Jan. 9, 1973, Ser. No. 322,136
Claims priority, application Germany, Jan. 11, 1972, 2201147
Int. Cl. D02g *1/16*
U.S. Cl. 28—72.12 6 Claims



1. A process for the manufacture of slub yarns from continuous filaments, which comprises feeding continuous filaments through the inlet orifice of a guide tube at a feed rate superior to the withdrawal rate at the outlet orifice, and sucking them into a connecting tube by means of a sucking jet in such a manner that an increasingly enlarging open loop is formed; wherein a gaseous medium, in intervals and periods of time programmed by a control system, is blown into the connecting tube, thereby passing through the feeder tube of a blowing jet mounted to the end of the connecting tube which is adjacent to the guide tube; the gaseous medium causing a ligature of the neck of the open loop of the yarn, which loop so ligatured is subsequently united over its total length with the continuous filament.

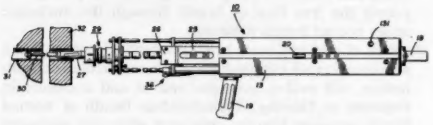
3,854,314
STEP CONTROLLED TUBE EXPANDER

Paul Warren Martin, Springfield, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 25, 1973, Ser. No. 382,413
Int. Cl. B21d *39/06*
U.S. Cl. 72—122 10 Claims

1. Tube expander apparatus comprising in combination:
a. a rotatable expander for insertion into an end of a receiving tube to be expanded against a header sheet;
b. motor means for rotatably driving said expander within the receiving tube in rolling relation to a longitudinal wall segment thereof for effecting tube expansion of the segment against the header;
c. a stop collar supported on said expander at a location outward of the receiving tube end to prevent said expan-

der from advancing inward of the tube beyond said segment while said rolling relation is being conducted; and d. control means operable after said expansion is completed to displaceably step said collar to a support location a predetermined distance away from the tube end for said expander to subsequently conduct expansion on an additional wall segment of said tube.

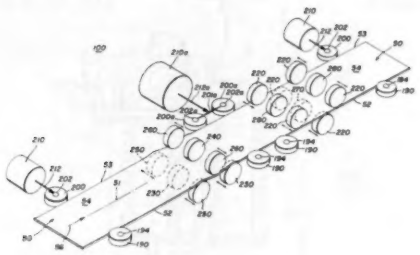


3,854,315

VARIABLE WIDTH STRIP CONDITIONER

Alvin L. Winkler, Oak Lawn, Ill., assignor to Interlake, Inc., Chicago, Ill.

Filed Dec. 28, 1973, Ser. No. 429,154
Int. Cl. B21d *1/05;* **B65h** *17/20*
U.S. Cl. 72—165 **26 Claims**



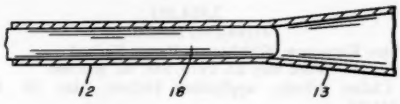
1. Apparatus for conditioning elongated metal strips of different widths comprising means supporting the strip for longitudinal movement along a predetermined planar datum path, first work rolls for deflecting the longitudinal edge portions of the strip along one edge thereof out of the predetermined path, second work rolls transversely aligned with said first work rolls for deflecting the longitudinal edge portions of the strip along the other edge thereof out of the predetermined path, means to hold the center longitudinal portion of the strip in the predetermined path adjacent to and disposed transversely with respect to said first and second work rolls, third work rolls for deflecting the center portion of the strip out of the predetermined path at a point disposed longitudinally from said first and second work rolls, first support rolls disposed in transverse alignment with said third work rolls for holding the edge portions of the strip along the one edge thereof in the predetermined path, second support rolls disposed in transverse alignment with said third work rolls and said first support rolls for holding the edge portions of the strip along the other edge thereof in the predetermined path, first mounting structure for said first work rolls and said first support rolls for positioning the same at selected distances away from the center line of the predetermined path to accommodate corresponding different widths of strips to be engaged thereby, and second mounting structure for said second work rolls and said second support rolls to mount the same for movement toward and away from said first mounting structure for positioning the same at selected distances away from the center line of the predetermined path to accommodate corresponding different widths of strips to be engaged thereby.

3,854,316

METHOD OF MAKING A HOLLOW METAL BAT WITH A UNIFORM WALL THICKNESS

Richard C. Wilson, Arcadia, Calif., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 179,666, Sept. 13, 1971,. This application Jan. 22, 1973, Ser. No. 325,423
Int. Cl. B21k *17/00*
U.S. Cl. 72—370 **2 Claims**



1. A method of making a hollow metal bat having a non-uniform weight per unit length characteristic, said bat comprising an elongated hollow metal body having a cylindrical barrel portion of one diameter tapering through a transition portion to a cylindrical handle portion of reduced diameter, the method comprising the steps of

placing a longitudinal portion of a hollow metal tube blank having a substantially uniform wall thickness and diameter on a fixed mandrel having a constant outer diameter corresponding to the inner diameter of the cylindrical handle portion to be formed on the mandrel,

maintaining a longitudinally fixed relative relationship between the mandrel and the tube blank,

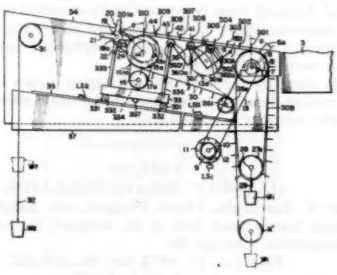
reducing the inner and outer diameters of the longitudinal portion of the tube placed on the mandrel to form the handle and transition portions of the bat body, and to provide the longitudinal tube portion with a wall thickness substantially the same as that of the hollow tube blank.

3,854,317

SPACED FORWARDING DEVICE FOR CUT WIRE

Hiroki Sato, and Norimitsu Yoshida, both of Chigasaki, Japan, assignors to Neturen Company Ltd., Tokyo, Japan

Filed Apr. 26, 1973, Ser. No. 354,912
Claims priority, application Japan, Apr. 26, 1972, 47-41274
Int. Cl. B21f *23/00*
U.S. Cl. 72—422 **7 Claims**



1. A spaced forwarding device for cut wires comprising

a. chain means including a plurality of wire arresting bosses at predetermined intervals on the periphery of said chain;

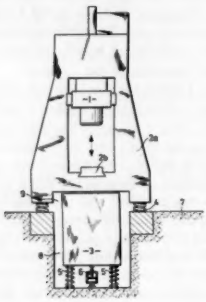
b. inclined plate means, wherein said chain means has a first inclined portion following said inclined plate means and a second vertical portion;

c. at least three rotatable wheel means:

d. first weight means suspended from a first of said rotatable wheel means positioned at the top of the inclined portion of said chain means and second weight means suspended

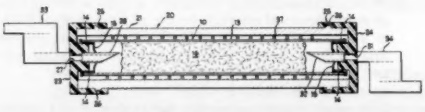
from a second of said rotatable wheel means positioned at the bottom of said vertical portion of said chain means, wherein said second weight is greater than said first weight and said wheel means can rotate intermittently and said first wheel means can be shifted along said inclined plate means whereby cut wires are engaged one by one by said arresting bosses and are moved down said inclined plate means due to the dependent or independent intermittent rotating of said wheel means.

3,854,318
FORGING MACHINE
Vaino Korpeinen, Niittykumpu Itapaa, Finland
Filed May 23, 1973, Ser. No. 363,064
Claims priority, application Finland, May 26, 1972, 1481/72
Int. Cl. B21j *13/04*
U.S. Cl. 72—465 **5 Claims**



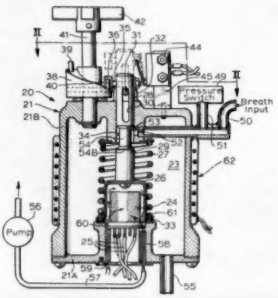
1. A forging machine comprising
a frame adapted to be supported on a foundation,
said frame including an affixed anvil and a ram block mounted for dropping movement relative to the frame for impact against the anvil supporting a workpiece,
said frame means being resiliently supported on a foundation by spring means for movement of predetermined amplitude after said impact,
a damping mass mounted adjacent the frame for movement upon impact of the dropping head against the anvil,
said damping mass being resiliently mounted relative to a support surface for amplitude of movement after said impact greater than said predetermined amplitude of movement of the frame, and
said damping mass including damping means to dampen motion created by contact with the frame after impact of the dropping head and anvil.

3,854,319
ALCOHOLIC BREATH SIMULATOR
James E. Burroughs, Mount Prospect, and Joseph P. Hoppesch, Streamwood, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed Oct. 16, 1972, Ser. No. 298,082
Int. Cl. G01n *31/00*
U.S. Cl. 73—1 A **5 Claims**



1. A device useful in simulating alcoholic breath to calibrate breath analyzers, comprising:
a disposable, elongated sealed enclosure containing an absorbent material which has been impregnated with a solution including ethyl alcohol to produce a concentration of alcohol vapor within said enclosure,
the alcohol-impregnated absorbent material substantially filling said enclosure but providing ample air passages to permit the free flow of breath through the enclosure under normal breath pressures,
the ends of said enclosure being pierceable in order that a simulated breath sample, having a known alcohol concentration, will evolve from one end of said enclosure in response to blowing of alcohol-free breath at normal breath pressures into the other end when said enclosure is maintained at a given temperature,
the alcohol-free breath displacing the alcohol vapor produced by the alcohol-impregnated absorbent material.

3,854,320
QUIESCENT BREATH TESTING SYSTEM
James E. Burroughs, Mt. Prospect; John W. Seibert, Aurora, and Joseph P. Hoppesch, Schaumburg, all of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 11, 1972, Ser. No. 313,890
Int. Cl. G01n *31/00*
U.S. Cl. 73—23 **6 Claims**

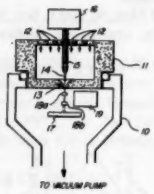


1. In a breath testing system of the type employing an alcohol sensor unit and having means for providing a breath sample for testing which sample is the result of a predetermined, essentially continuous and uninterrupted blowing of breath so that the sample obtained is suitable lung breath, the improvement comprising:
means for receiving and holding the lung breath sample for a time period sufficient for the sample to achieve an essentially quiescent state; and
means, including the sensor unit, for deriving an electrical output signal indicative of the alcohol concentration in the essentially quiescent sample, including means for shielding the sensor unit from the breath sample until it has achieved the essentially quiescent state and for thereafter unshielding the sensor unit for deriving the electrical output signal,
whereby said sensor unit is protected from flow effects and from reacting to any but the suitable lung sample.

3,854,321
AEROSOL BEAM DEVICE AND METHOD
Barton E. Dahneke, 89 Johnson Rd., Palmyra, N.Y. 14522
Filed Apr. 27, 1973, Ser. No. 355,047
Int. Cl. G01n *15/00, 1/22*
U.S. Cl. 73—28 **16 Claims**

1. A device for detecting airborne particles comprising:
a. means for directing a stream of an aerosol, comprised of a continuous gaseous phase and a discontinuous phase of

said particles, through an aperture and into a vacuum chamber whereby the gaseous phase expands away from said particles thereby forming an aerosol beam and

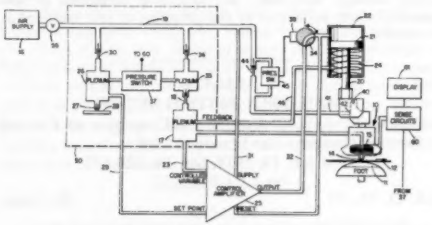


b. means for measuring the times of flight of said particles over at least one portion of their trajectory.

3,854,322
CALIPER GAUGE

David F. Wood, Acton, and Richard F. Murphy, Wilmington, both of Mass., assignors to LFE Corporation, Waltham, Mass.

Filed June 6, 1973, Ser. No. 367,631
Int. Cl. G01b *13/02*
U.S. Cl. 73—37.5 **8 Claims**



1. A caliper gauge for measuring the thickness of moving sheet material comprising:

a. a reference plate over which sheet material is transported;

b. a pivotally supported sensing head facing said plate such that said sheet material passes therebetween;

c. a pneumatic nozzle in said sensing head facing said plate;

d. a pneumatic feedback control system driving a pneumatic piston responsive to backpressure on said nozzle to move said sensing head maintaining said head a predetermined space from said sheet material;

e. a pneumatic line, said line being closed by said sensing head in its normal pivotal position and opened by said sensing head being moved to an abnormal pivotal position;

f. a pressure sensor, said pressure sensor being responsive to increased flow in said line to cause retraction of said piston; and

g. means for continuously monitoring the spacing between said sensing head and said plate.

3,854,323
METHOD AND APPARATUS FOR MONITORING THE SAND CONCENTRATION IN A FLOWING WELL

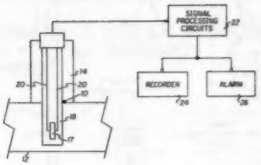
Daniel P. Hearn, Richardson, and Thomas K. Perkins, Dallas, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 31, 1974, Ser. No. 438,382
Int. Cl. E21b *47/00*
U.S. Cl. 73—61 R **19 Claims**

1. The method of determining the sand concentration in the produced fluids of a well comprising the steps of:

a. deriving from the acoustic noise generated by the flow stream of said fluids a first broad band electrical signal;

b. filtering said first electrical signal to obtain therefrom at least one preselected narrow band frequency component whose amplitude approximates a first known function of the flow velocity of said fluids and the sand concentration therein;



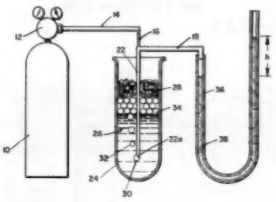
c. deriving a second electrical signal responsive to the movement of said flow stream whose amplitude approximates a second known function of said flow velocity and said sand concentration; and

d. computing from said at least one frequency component and said second signal an output signal responsive thereto whose amplitude represents a simultaneous solution of said first and second functions for said sand concentration independent of said flow velocity.

3,854,324
BLOOD CLOTTING TIME AND STRENGTH MEASURING SYSTEM

Thomas L. Altshuler, 110 Hillcrest Rd., Concord, Mass. 01742, and John H. Altshuler, 5700 Dunbarton Dr., Englewood, Colo. 80110

Continuation-in-part of Ser. No. 192,875, Oct. 27, 1971, abandoned. This application June 11, 1973, Ser. No. 368,970
Int. Cl. G01n *33/16*
U.S. Cl. 73—64.1 **19 Claims**



1. The method of detecting the commencement of clotting in a blood specimen comprising the steps of

A. bubbling a gas below the surface of the specimen,

B. monitoring the pressure required to blow the bubbles in the specimen,

C. rejecting the high frequency pressure fluctuations characteristic of bubbles blown in unclotted blood,

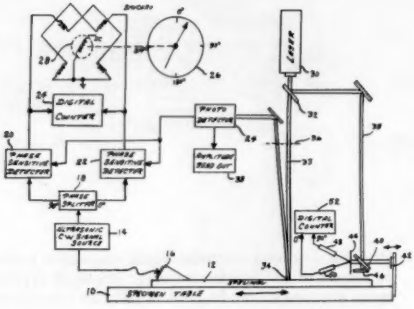
D. detecting only the relatively low frequency fluctuations of the pressure which are characteristic of bubbles blown in clotting blood, and

E. measuring the time of commencement of the low frequency pressure fluctuations.

3,854,325
METHOD AND MEANS FOR DETERMINING FATIGUE DAMAGE AND SURFACE STRESS

Forrest M. Coate, Hawthorne, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 13, 1973, Ser. No. 379,029
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.6 **5 Claims**

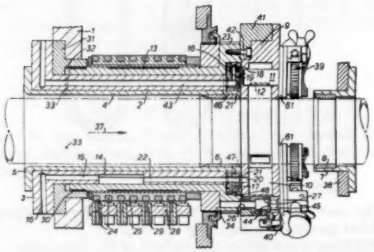


1. A method for determining early fatigue damage and surface stress in metals comprising the steps of: transmitting an ultrasonic wave across a surface to be examined; directing a beam of coherent radiation at a point on the said surface, through the ultrasonic wave; detecting the reflected coherent radiation; moving the surface in a known manner; measuring the change in amplitude of the reflected radiation, and comparing the phase relationship of the reflected radiation to the ultrasonic wave whereby variations in said amplitude and phase will be indicative of fatigue damage and surface stress.

3,854,326
ROTARY ULTRASONIC TESTING APPARATUS

Matthew James Hetherington, near Market Harborough, and Peter Atkinson, Stanion, near Kettering, both of England, assignors to British Steel Corporation, London, England

Filed May 31, 1973, Ser. No. 365,524
Claims priority, application Great Britain, June 8, 1972, 26827/72
Int. Cl. G01m *9/24*
U.S. Cl. 73—67.8 S **7 Claims**

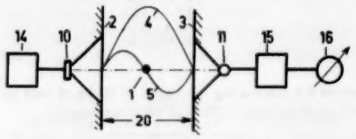


1. Rotary ultrasonic testing apparatus comprising a single annular stator carrying a first replaceable hollow tube guideway; a replaceable annular ultrasonic probe assembly disposed beyond one end of the stator and mounted for rotation solely on said single annular stator; and a second replaceable hollow tube guideway mounted separate from the stator on the opposite side of the probe assembly from the stator.

3,854,327
METHOD AND APPARATUS FOR DETERMINING THE CROSS SECTION OF MATERIAL USING A SOUND FIELD

Ernst Felix, Uster, Switzerland, assignor to Zellweger, Ltd., Ulster, Switzerland

Filed Mar. 9, 1973, Ser. No. 339,883
Claims priority, application Switzerland, Mar. 15, 1972, 3828/72
Int. Cl. G01n *29/00*
U.S. Cl. 73—69 **26 Claims**

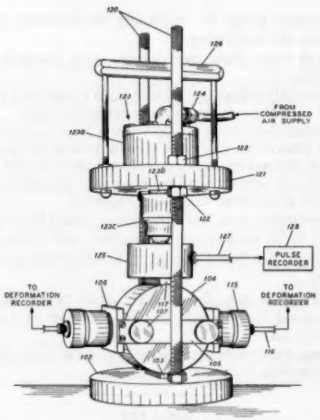


1. A method of at least approximately determining the cross section of filamentary or wire form material, comprising the steps of generating standing waves with at least two different frequencies within a resonator tuned such that at least one pressure maximum of the first standing wave and at least one pressure minimum of another standing wave substantially coincide at a point in the resonator, guiding the material to be tested through said point and detecting variations in said standing waves produced by the presence of said material to be tested.

3,854,328
RESILIENCY TESTING DEVICE

Robert J. Schmidt, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jan. 18, 1973, Ser. No. 324,637
Int. Cl. G01n *3/32*
U.S. Cl. 73—91 **24 Claims**



1. An apparatus for use in measuring the resiliency of a sample comprising:

a frame means,

means for mounting a sample to be measured in said frame means,

means for applying a pulsating external force to the said sample to cause said sample to sequentially deform and recover in sequential deformations and recoveries corresponding to said force,

sensing means on said frame means, said sensing means operatively arranged to sense a deformation and recovery of said sample, and

means for recording said sequential deformations and recoveries.

3,854,329

APPARATUS FOR WEB TENSION MEASUREMENT

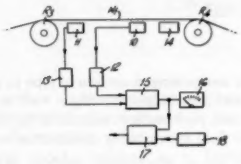
Graham Robin Scott Jones, Bristol, England, assignor to Masson Scott Trissell Engineering Ltd., Bristol, England

Filed Nov. 21, 1972, Ser. No. 308,424

Claims priority, application Great Britain, Nov. 23, 1971, 54242/71

Int. Cl. G01l *5/10*

U.S. Cl. 73—143 **6 Claims**



1. Apparatus for measuring tension of a web stretched between supports, comprising means for exciting transverse vibrations in said web, first and second sensors positioned at first and second distances respectively along the web from said exciting means, and means responsive to signals from both said sensors being provided for converting the time interval between the sensing of the vibration in the web, caused by said exciting means, at said first and said second sensors into an indication of the tension of said web.

3,854,330

APPARATUS FOR MEASURING MASS DENSITY VARIATIONS IN A STAPLE FIBER SLIVER ON SPINNING PREPARATORY MACHINES

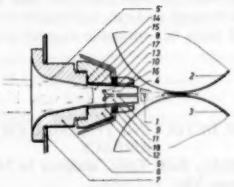
Rudolf Wildbolz, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Apr. 13, 1973, Ser. No. 350,790

Claims priority, application Switzerland, May 10, 1972, 6919/72

Int. Cl. G01n *9/00, 33/36*

U.S. Cl. 73—160 **12 Claims**



1. An apparatus for measuring mass density variations in a staple fiber sliver on spinning preparatory machines, comprising a sliver funnel having a throughput duct converging in the direction of flow of the fiber material, said sliver funnel embodying substantially centrally symmetrical members which are radially elastically deflectable and serving to condense at all sides the throughpassing fiber sliver, amplifier means, at least one detector operatively connected with said amplifier means and with said deflectable members for transmitting a signal to said amplifier means which corresponds to the deflection of at least one of said deflectable members, said detector comprising an air outlet opening arranged in such close vicinity to an associated one of said deflectable members that said associated member acts as an impact plate for the thus formed pneumatic micrometer.

3,854,331

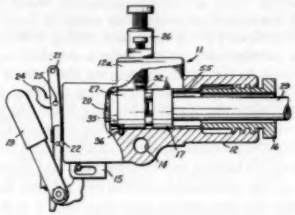
VENTED TEST BARREL ASSEMBLY FOR REVOLVER AMMUNITION

Charles H. Bateman, Jr., East Haven; Allan A. Campbell, Trumbull, and James J. Capasso, Shelton, all of Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Apr. 3, 1973, Ser. No. 347,381

Int. Cl. G01l *5/14*

U.S. Cl. 73—167 **5 Claims**



1. A test barrel assembly for a universal receiver having cartridge firing means, said test barrel assembly comprising a cylinder having a single chamber for receiving a cartridge and having a forward end, a barrel of predetermined length having a longitudinal bore and having a rear end, attachment means for securing said cylinder to said barrel with said chamber and said bore in axial alignment, and spacer means for producing a gap of predetermined thickness between the forward end of said cylinder and the rear end of said barrel.

3,854,332

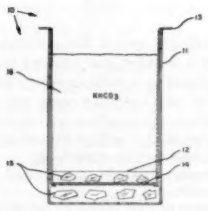
INCENDIARY CAPTURE DEVICE

Warren K. Smith, Poway, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 24, 1973, Ser. No. 400,449

Int. Cl. G01n *33/22*

U.S. Cl. 73—167 **10 Claims**



1. A method of investigating the effectiveness of incendiary weapons including:

placing a plurality of containers in spaced relationship in an area surrounding a weapon to be tested;

creating a fluidized bed of inert powder in each container;

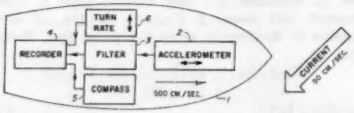
activating the test weapon; and

examining any incendiary particles falling into said fluidized beds.

3,854,333
METHOD FOR DETERMINING DIRECTION AND SPEED OF OCEAN CURRENTS

Joseph D. Richard, 3613 Loquat Ave., Miami, Fla. 33133

Filed Apr. 25, 1973, Ser. No. 354,368
Int. Cl. G01d 1/00
U.S. Cl. 73—170 A 8 Claims

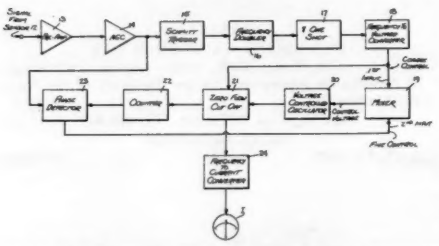


1. The method for measuring the speed and direction of an ocean current from a moving powered vessel comprising: measuring horizontal accelerations along at least one axis of the aforementioned powered vessel during a turning maneuver; while substantially maintaining a constant speed of the vessel relative to the water measuring the rate of turn of the aforementioned powered vessel during the said turning maneuver; indicating the compass heading of the aforementioned powered vessel during the said turning maneuver; computing the speed of the aforementioned ocean current from the said measured accelerations and turning rate; and determining the direction of the aforementioned ocean current by indicating the compass heading which coincides with a null in the said measured acceleration.

3,854,334
SIGNAL RECOVERY SYSTEM FOR VORTEX TYPE FLOWMETER

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Oct. 1, 1973, Ser. No. 402,387
Int. Cl. G01f 1/00
U.S. Cl. 73—194 B 9 Claims



1. A signal recovery system for a vortex-type flowmeter wherein the fluid is directed past a vortex-producing element to cause vortex shedding at a fundamental frequency proportional to flow rate, said shedding being detected by a sensor yielding an electrical signal subject to intermittent fading for relatively brief periods due to flow disturbances which inhibit vortex shedding, said system comprising:

A. an electronic flywheel constituted by a voltage-controlled-oscillator;

B. means coupled to said sensor to produce a control voltage whose amplitude is a function of said fundamental frequency, said means having a relatively slow decay characteristic whereby the control voltage is sustained during fading periods;

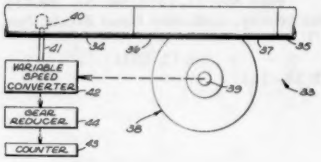
C. means applying said control voltage to said oscillator to generate an output frequency which depends on the amplitude of said voltage and which continues during said fading periods, and;

D. means to drive a continuous flow rate indication from said oscillator output frequency.

3,854,335
FLOWMETER

Lawrence Taylor Garnett, Fullerton, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 2, 1973, Ser. No. 319,988
Int. Cl. G01f 15/02
U.S. Cl. 73—233 12 Claims



1. A flowmeter comprising: a section of pipe to carry a fluid to be metered, said pipe section having a wall; a fluid motor connected with said pipe section, said fluid motor having an output shaft, said fluid motor being constructed to rotate said output shaft thereof at an angular velocity approximately proportional to the rate of volume flow of said fluid therethrough; a speed converter having an input shaft and an output shaft, said speed converter being connected in a manner such that the input shaft thereof is rotated at an angular velocity directly proportional to that of said fluid motor output shaft; output means connected from said converter output shaft, the average gear ratio of said converter being R_n over one revolution of said converter input shaft; and control means connected with said converter for varying the magnitude of R_n, said control means including a plate, said converter including a housing, an arm pivoted on said housing, said converter input shaft being rotatable about an axis parallel to the pivot axis of said arm, said converter input shaft being mounted in a fixed axial but rotatable angular position through said arm, said arm having a pin spaced from the pivot axis thereof, a plate having a fork with a slot therein, said fork being fixed with said plate in a position straddling said pin, said plate having a slot therein, said slot having a uniform width and lengthwise direction running normal to a plane through said arm pivot axis and said converter output shaft axis, a releasable clamp screw extending through said plate slot and threaded into said housing, said clamp screw having a shank with a diameter slightly smaller than said plate slow width, a nut fixed relative to said plate with an axis parallel to the length dimension of said plate slot, and an adjustment screw threaded through said nut, said adjustment screw being held in a fixed axial but rotatable angular position on said housing.

3,854,336
METHOD FOR DETECTING THERMAL CHANGES ON A SURFACE

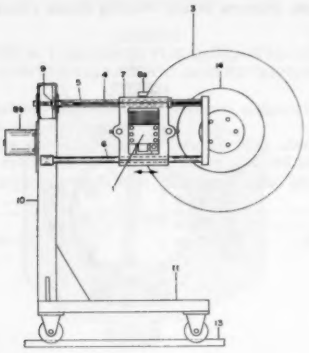
Malcolm M. Bibby, Bath, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 26, 1972, Ser. No. 221,010
Int. Cl. G01k 3/06
U.S. Cl. 73—351 18 Claims

1. In a method for detecting by infrared scanning thermal changes on a surface of a pneumatic object subject to imposition of load and the generation of heat when in service wherein the object is heated, signals are generated proportional to surface temperature variation and the surface is subjected to repeated scans, the improvement which comprises

generating reference values of signals representative of a scanning interval over a surface of the object,

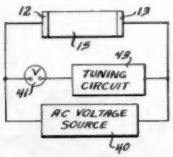
subtracting said reference values from values of signals representative of a subsequent scanning interval over the same surface area, making the subtractions between a series of scanning intervals and summing the resulting differences.



3,854,337
CHARGE STORAGE DEVICE

Paul R. Moran, Madison, Wis., and Ervin B. Podgorsak, Toronto, Ontario, Canada, assignors to The United States of America as represented by the United States Atomic Energy, Washington, D.C.

Filed Oct. 1, 1973, Ser. No. 402,412
Int. Cl. G01k *7/00*
U.S. Cl. 73—362 R **7 Claims**



1. A temperature programmable charge storage device, comprising an ionic solid dielectric doped such that the concentration of the most abundant impurity ion is at least six times greater than the concentration of all other impurities combined, a pair of electrodes between which said dielectric is disposed with the electrical conductivity of said electrodes being less than the ionic conductivity of said dielectric, thereby preventing injection of charge carriers from said electrodes into said dielectric.

3,854,338
DIRECT READING SPECIFIC GRAVITY INDICATOR

James A. Shorten, 611 W. Belmont, Chicago, Ill. 60657

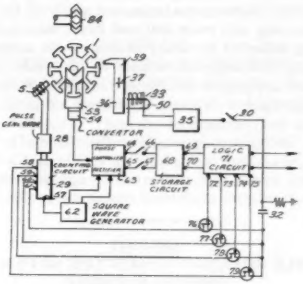
Filed Aug. 3, 1973, Ser. No. 385,486
Int. Cl. G01n *9/02*
U.S. Cl. 73—433 **7 Claims**

1. A direct reading specific gravity indicator comprising a graduated container suitable for holding a volume of liquid, the graduations on said container being calibrated to indicate a continuous sequence of specific gravities within a predetermined range; measuring means attached to said container and sized for holding a predetermined volume of said liquid; and support means connected to said container and operatively positioned with respect to said measuring means for suspending the container in horizontal balance when either a volume of liquid equal to said predetermined volume or a volume of matter equal in weight to the weight of said predetermined volume of liquid is placed in said measuring means.

3,854,339
PROCESS AND DEVICE FOR BALANCING OF ROTORS

Richard Muller, Worfelden, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany

Filed Aug. 31, 1973, Ser. No. 393,309
Claims priority, application Germany, Sept. 1, 1972, 2243002
Int. Cl. G01m *1/16*
U.S. Cl. 73—462 **11 Claims**



1. Apparatus for stopping a rotor at a given position comprising:

means for mounting a rotor for rotation,

means for rotating the mounted rotor,

means for sensing portions of a rotating rotor extending about its periphery and separated by areas having characteristics different from said portions and producing a train of pulses, each pulse being associated with a portion,

means connected to said sensing means for receiving said train of pulses, counting said pulses and providing a reference pulse for each revolution of said rotor, and

means responsive to said reference pulse for stopping said rotor in a given angular position.

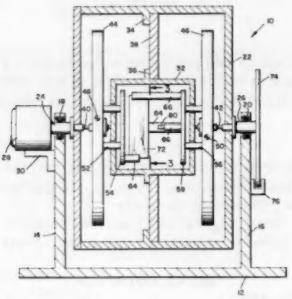
3,854,340
ROTATING DYNAMIC ACCELEROMETER

Curtis C. Bell, Inglewood, and Robert L. Forward, Oxnard, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed June 26, 1972, Ser. No. 266,167
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 R **10 Claims**

1. A rotating dynamic accelerometer comprising:

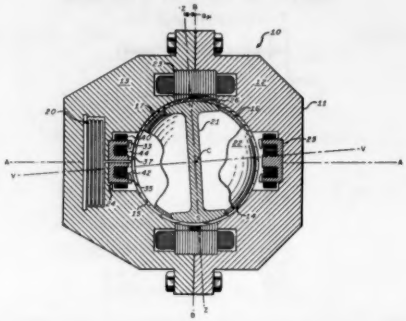
a base;
mounting means on said base for defining an axis of rotation;
a body mounted for rotation on said base with respect to said base, means for rotating said body with respect to said base;
a mass;
means for mounting said mass on said body for rotation with said body on said axis with respect to said base, with the center of said mass being away from said axis so that, when an acceleration is applied to said base at an angle to said axis, said mass tends to rotate with respect to said axis;



said means for mounting said mass including spring means connected between said mass and said body for resiliently connecting said mass and said body, said spring means being deflected by rotary motion of the center of mass around said axis with respect to said body, said spring means applying a returning force, said mass and said spring means being sized to provide torsional resonance at the body rotation speed; and
means for converting rotation of the center of said mass around said axis with respect to said body due to accelerational forces applied thereon to signals so that, as said mass is rotated, modulated signals are produced.

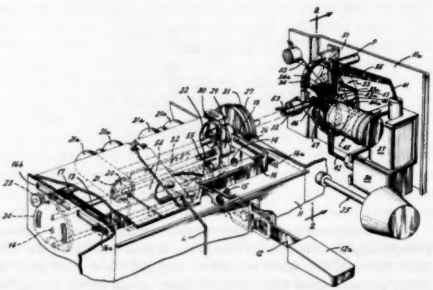
3,854,341
MULTIPLE ROTATION GYROSCOPE WITH A SINGLE MOVING ELEMENT
Thomas R. Quermann, Huntington Station, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.
Filed May 21, 1973, Ser. No. 365,871
Int. Cl. G01c *19/20, 19/08*
U.S. Cl. 74—5.7 **19 Claims**

1. A multiple rotation gyroscopic apparatus comprising
first power source means,
second power source means,
an inertial element having first and second mutually perpendicular axes of inertial symmetry, said inertial element having a moment of inertia about said first axis which is greater than its moment of inertia about said second axis,
gimbal less housing means including an internal cavity enclosing said inertial element,
fluid means contained within said cavity for suspending said inertial element in neutral buoyancy,
first motor drive means coupled to said first power source means and disposed in said housing means external to said cavity around the equatorial perimeter of said cavity for rotating said inertial element about said first axis at a high rate of speed,
second motor means coupled to said second power source means and disposed in said housing means external to said cavity and substantially aligned along said first axes of said inertial element for rotating said inertial element about said second axis at a lower rate of speed than about said first axis, and
pickoff-torquer means cooperative with said inertial element, disposed in said housing means external to said



cavity and substantially aligned along said second axis for sensing angular displacements of said inertial element with respect to predetermined axes and producing coercive torques which are applied to said inertial element with respect to said predetermined axes.

3,854,342
RADIO TUNING APPARATUS
Robert T. Smith, Jr., Southampton, Pa., assignor to Philco-Ford Corporation, Blue Bell, Pa.
Filed Dec. 12, 1973, Ser. No. 424,098
Int. Cl. F16h *35/18*
U.S. Cl. 74—10.5 **11 Claims**



1. In radio receiving apparatus of the type including adjustable means for tuning over a predetermined band of frequencies, improved drive means for moving said tuning means at a relatively slow rate for tuning in one direction and at a relatively rapid rate for repositioning in the opposite direction, said drive means comprising: driven wheel means drivingly coupled with said tuning means; a unidirectionally rotatable motor; a lever; means defining a pivot for said lever in provision for rocking movements thereof; first and second solenoid means coupled with said lever, each selectively energizable to rock said lever in one or the other direction; first and second drive wheel means, of different diameters, driven with said motor; said lever being operable, upon energization of said first solenoid means, to rock said lever in one direction to effect a coupling between said first drive wheel means and said driven wheel means in provision of the recited relatively slow drive rate of said tuning means, and, upon energization of said second solenoid means, to rock said lever in the other direction to effect a coupling between said second drive wheel

means and said driven wheel means in provision of the recited relatively rapid drive rate of said tuning means.

3,854,343

REVERSING CAM DRUM FOR QUICK TRAVERSE WINDER AND TRAVELLER FOR SAID REVERSING CAM DRUM

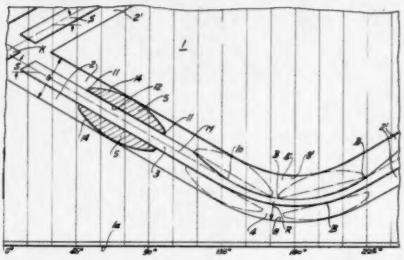
Erhard Thaddaus May, Kempten, Germany, assignor to Firma A. Ott, Kempten, Germany

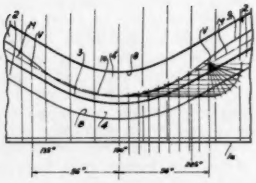
Continuation of Ser. No. 155,821, June 23, 1971, abandoned. This application Aug. 15, 1973, Ser. No. 388,609

Claims priority, application Germany, June 26, 1970, 2031562

Int. Cl. F16h *25/12*

U.S. Cl. 74—57 **5 Claims**





1. A reversing cam drum for textile machines, especially for quick traversing winders, including a pair of helical grooves having opposite hand threads, outer limiting surfaces and reversing points at the ends of drum claimed in claim **1**, drum respectively, a central guide rail between the pair of grooves, and a traversing traveller guided within said pair of grooves, said opposite hand threads of said pair of grooves being interconnected by transition curves at said reversing points, wherein said transition curves each define one-half of a complete sine cycle, wherein said outer limiting surfaces comprise a pair of lateral surfaces defining limiting envelopes of the path of said traveller whereby a point of said traveller moves through the said cycle at each transition curve, and wherein said central guide rail is uninterrupted within said transition curve.

3,854,344

ASSEMBLY ADAPTED TO BE ASSEMBLED FROM TWO SEPARATE DRIVING BODIES

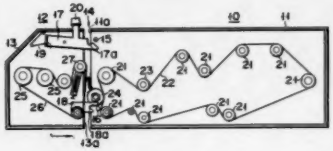
Minoru Konno, Oyama, and Mitsuo Ichiki, Tokyo, both of Japan, assignors to Copyer Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1973, Ser. No. 414,623

Claims priority, application Japan, Nov. 16, 1972, 47-131142

Int. Cl. F16h *7/00, 57/00, 57/02*

U.S. Cl. 74—216.5 **5 Claims**



1. An assembly adapted to be detachably assembled from first and second bodies, comprising means for mechanically connecting together these two bodies, a first chain belt provided in the first body so as to be driven, a second chain belt provided in the second body so as to be driven, and a transmission sprocket provided in the first body to be engaged with the first chain belt and, when the first and second bodies are mechanically connected together, adapted to be engaged with the second chain belt to permit the first and second chain belts to be operatively connected together.

3,854,345

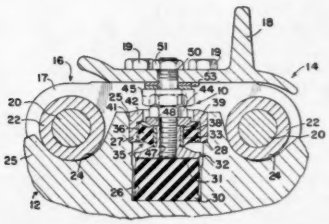
NOISE ATTENUATING IMPACT ABSORBING MEANS FOR SPROCKET TEETH AND TRACK

Harold L. Reinsma, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 20, 1974, Ser. No. 453,091

Int. Cl. F16h *55/30*

U.S. Cl. 74—243 R **17 Claims**



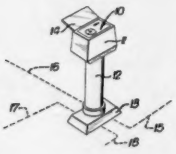
1. A drive sprocket for a track-laying vehicle having a plurality of equiangularly spaced teeth and notches and having impact absorbing noise suppressing means comprising; spring means mounted circumferentially about said sprocket within at least one of said plurality of teeth for absorbing impact energy, first contact means separate from said spring means and mounted radially outwardly from said spring means within said at least one tooth for coacting with said spring means and for transmitting impact forces to said spring means for absorption thereof, seal means mounted within said at least one tooth radially between a portion of said first contact means and said spring means for protectively sealing said spring means.

3,854,346

AUTOMATIC CONTROLLER DRIVE MECHANISM

Edwin J. Hunter, Riverside, Calif., assignor to The Toro Company, San Marcos, Calif.

Division of Ser. No. 190,530, Oct. 19, 1971, Pat. No. 3,735,779. This application Nov. 22, 1972, Ser. No. 308,649
Int. Cl. F16h *53/00*
U.S. Cl. 74—568 T 4 Claims



1. In an automatic control apparatus having a camming means for operating a series of cam followers, a constant speed motor, and clutch and transmission means for selectively connecting said camming means to said constant speed motor to be driven thereby past said cam followers, said followers offering resistance to the movement of said camming means thereby when engaged by said camming means, the improvement comprising the provision of:

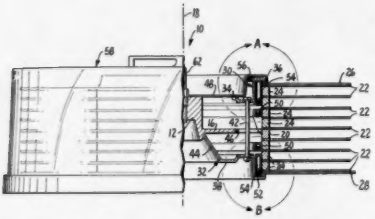
rapid advance means associated between said clutch and transmission means and said camming means for storing energy received from said motor during operation thereof and for advancing said camming means between engagements with said cam followers by said stored energy more rapidly than the advancement thereof by said motor.

3,854,347

DYNAMIC BALANCING DEVICE FOR A COMPUTER DISC MEMORY

Joseph Hellerich, 611 W. Belmont, Redwood City, Calif. 94061

Filed Aug. 15, 1973, Ser. No. 388,450
Int. Cl. F16f *15/22*
U.S. Cl. 74—573 8 Claims



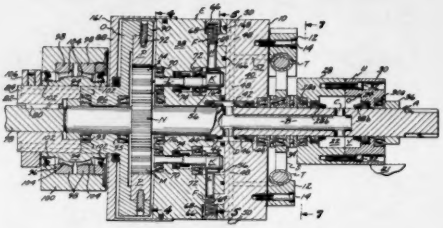
1. A dynamic balancer for use in a computer disc memory of the type having a plurality of memory discs, each disc having a center hole, support means for rotating the discs about a common axis, the support means including a plurality of spacer rings for separating the discs, top and bottom clamp rings for clamping the discs and the sapcer rings in a stack which is generally centered about the common axis, and a hub generally centered on the common axis within the center holes of the memory discs and having a flange attached to at least one of the spacer rings, the dynamic balancer comprising an annular support positioned within the center hole of, at least, one of the discs and exterior of the hub, the annular support having an annular cavity which encircles the common axis, and mass members which are contained by and freely movable within the annular support cavity.

3,854,348

VARIABLE SPEED TRANSMISSION

Gerald W. Stevenson, 8007 S. Michigan Ave., Whittier, Calif. 90602

Filed June 13, 1973, Ser. No. 369,414
Int. Cl. F16h *5/18, 39/00*
U.S. Cl. 74—774 11 Claims



1. In a transmission of the type that includes: a driving shaft; a plurality of planetary gears; a sun gear rigidly secured to said driving shaft; a plurality of first shafts having first and second ends, with said planetary gears affixed to said first ends, and each of said planetary gears in toothed engagement with said sungear; a housing rotatably supported on said driving shaft, said housing formed with at least one endless circular confined space therein that is filled with a first hydraulic fluid, and said housing rotatably supporting said first shafts in fixed relationship relative thereto; pump means operatively associated with said second ends of said shafts for pumping said hydraulic fluid in said confined space when said shafts are rotated; a driven shaft assembly coaxially aligned with said driving shaft and occupying a fixed position relative thereto, said driven shaft assembly including first gear means that are at all times in toothed engagement with said planetary gears, with the degree of rotation of said driven shaft asembly relative to said driving shaft being determined by the degree of actuation of said pumping means, said driving shaft and driven shaft assembly being in a one to one ratio when there is no actuation of said pumping means; the improvement for controlling the force required to actuate said pumping means to pump said first hydraulic fluid in said first confined space to regulate the degree of rotation of said driven shaft assembly relative to said driving shaft, said improvement comprising:

a. a plurality of rotatable valve members disposed in circumferentially spaced locations in said first confined space, said valve members capable of occupying fully open, fully closed and positions intermediate therebetween;

b. a plurality of circumferentially spaced parallel second shafts having first and second ends, said second shafts rotatably supported in said housing, and said valve members secured to said first ends of said second shafts; and

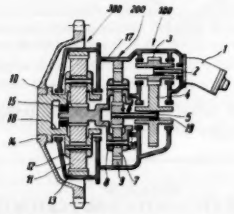
c. second means that rotate concurrently with said housing and are so operatively associated with said second ends of said first shafts that said valve members can be rotated between said fully open and fully closed positions to cause said driven shaft assembly to rotate at a desired speed ratio relative to the speed of rotation of said driving shaft.

3,854,349

MULTI-STAGE SPEED REDUCER WITH RESILIENT SHAFT SUPPORTS

Wilhelm Michling, Hattingen, Germany, assignor to Lohmann & Stolterfoht Aktiengesellschaft, Witten/Ruhr, Germany

Filed Dec. 11, 1972, Ser. No. 314,216
Claims priority, application Germany, Dec. 16, 1971, 7147881; Dec. 23, 1971, 2165286
Int. Cl. F16n 1/46
U.S. Cl. 74—801 6 Claims



1. Multi-stage speed reducing gear, including a first speed reducing stage having input pinion and large diameter output gear, the speed reducing gear further including first and second, serially operating planetary gears each having a central gear and planet gears journalled in a carrier,

the carrier of the second planetary gear having a hollow shaft, the central gear of the second planetary gears having a shaft end journalled in the hollow shaft, the improvement comprising:

resilient means for yieldingly journalling the shaft end in the hollow shaft for limited transverse displacement therein, and centering the shaft end in the hollow shaft upon no-load conditions;

the carrier of the first planetary gear being rigidly secured to and supported by the central gear of the second planetary gear, on one side of the central gear of the first planetary gear, for driving the latter central gear as the latter central gear is being resiliently supported by said resilient means in said hollow shaft;

the carrier of the first planetary gear as secured to the central gear of the second planetary gear, being supported by the latter central gear so as to permit pendulum movement of the portion of the carrier of the first planetary gear as extending on the other side of the central gear of the first planetary gear;

shaft means carrying the central gear of the first planetary gear for connecting the central gear of the first planetary gear to the large diameter output gear permitting limited angular displacement of the end of the shaft means relative to the large gear, the central gear of the first planetary gear meshing with the planet gears thereof and being journalled therewith and being free from additional bearing support; and

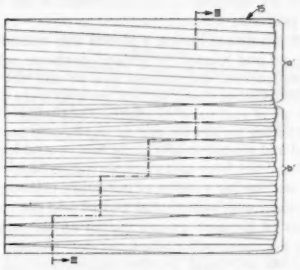
a housing for the speed-reducing gear, bearings for the pinion and for the large diameter output gear of the first reducing stage, and spur gears of the first and second planetary gears being secured to said housing.

3,854,350

PRODUCTION OF EXTERNALLY THREADED BOLTS OR THE LIKE WITH INTERSECTING RIGHT-HAND AND LEFT-HAND HELICES

Carl Otto Bauer; Ernst Bode; Karl Diehl, and Gerd Rauhaus, all of Wuppertal, Germany, assignors to Carl Bauer, Wuppertal, Germany

Filed Oct. 13, 1972, Ser. No. 297,439
Claims priority, application Germany, Oct. 15, 1971, 2151356
Int. Cl. B21k 5/20
U.S. Cl. 76—107 R 8 Claims



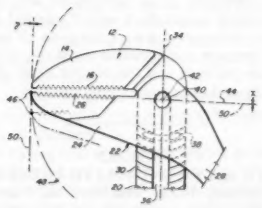
1. A method of producing rolling dies for simultaneous rolling of intersecting left-hand and right-hand threads into the external surfaces of rod-like metallic blanks, comprising the steps of making a master die having a flat surface and forming in said flat surface a profile corresponding to the profile of a finished blank; and utilizing said master die for the production of rolling dies having profiles complementary to the profile of said master die.

3,854,351

ARC JOINT PLIER

Ralph Martin, Colorado Springs, Colo., assignor to Western Forge Corporation, Colorado Springs, Colo.

Filed Oct. 12, 1973, Ser. No. 405,860
Int. Cl. B25b 7/04
U.S. Cl. 81—414 1 Claim



1. An arc joint slip-type plier tool comprising:

a first jaw member having a jaw head portion with an elongated gripping surface thereon and a handle portion extending generally transversely therefrom,

a second jaw member having a jaw head portion with an elongated gripping surface thereon and a handle portion extending generally transversely therefrom,

the elongated gripping surfaces on said first jaw member and the elongated gripping surface on said second jaw member facing one another in generally parallel relationship and defining a jaw cavity therebetween terminating inwardly and closed adjacent the handle portions and

terminating outwardly in a jaw cavity opening defined by terminal transverse outer surfaces of said jaw portions,

an elongated slot in one of the handle portions extending at substantially a right angle to the elongated gripping surfaces and defined by spaced parallel side surfaces on opposite sides of a central longitudinal axis of said slot,

pivot pin means slidably rotatably mounted in said slot between said spaced parallel side surfaces and pivotally connecting the handle portions for pivotal movement relative to one another between an open jaw cavity position and a closed jaw cavity position and slidably connecting the handle portions for sliding adjustment along said slot to variably adjusted positions to vary the spacing between the elongated gripping surfaces in the closed jaw cavity position,

said pivot pin means having a pivotal axis extending transversely of and located in general coplanar relationship with said central longitudinal axis of said slot and with said elongated gripping surface on said second jaw portion in all of said variably adjusted positions,

an arc-type lug means on one of the handle portions and located and spaced axially along said central longitudinal axis of said slot from said pivot pin means beyond said jaw cavity and having a radius of curvature extending toward and coaxial with said pivotal axis of said pin means,

a plurality of arc-type groove means on the other of the handle portions each being separately slidably rotatably cooperable with said arc-type lug means and having a radius of curvature extending toward said pivotal axis of said pin means and having a radius of curvature of equal length to the length of the radius of curvature of said arc-type lug means,

said pin means and said pivotal axis provided thereby being movable along said slot to a plurality of variably displaced positions whereat said arc-type lug means is slidably rotatably cooperably associated with various separate ones of said arc-type groove means for relative rotatable sliding movement about said pivotal axis of said pivot pin means,

the transverse terminal outer surfaces of said jaw portions being substantially aligned and coterminous in each of said adjusted positions when the jaw portions are in the closed jaw cavity position and the path of relative movement of said transverse terminal outer surfaces of said jaw portions in each of said adjusted positions during movement between said closed jaw cavity position and said open jaw cavity position being arcuate about said pivotal axis of said pin means whereby the distance between said terminal transverse outer surfaces of said jaw portions and the central longitudinal axis of said slot in any open jaw cavity position is always equal to or less than the distance between said terminal transverse outer surfaces of said jaw portions and the central longitudinal axis of said slot in said closed jaw cavity position.

3,854,352

PNEUMATICALLY-CONTROLLED LATHE SYSTEM

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

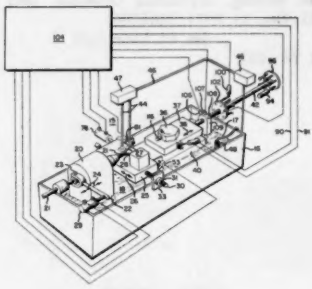
Filed June 6, 1973, Ser. No. 367,582
Int. Cl. B23b *21/00, 13/00, 3/28*
U.S. Cl. 82—21 A **7 Claims**

1. A gas-controlled system for an automatic turret lathe having a crossfeed table and a turret ram table, said system comprising:

a. a cylinder having a gas-operated piston connected between a fixed part and one of said tables for moving said table from one end position to the other;

b. two fixed gas-operated sensors disposed to sense when said one of said tables is at each of its end positions for developing respective position signals;

c. two liquid-operated dampers fixed with respect to and cooperating with said one of said tables for slowing down the movement of said table from a predetermined position during its travel in each direction; and



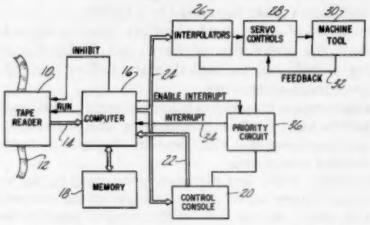
d. gas-controlled means responsive to said position signals for controlling gas flow to said cylinder.

3,854,353

METHOD AND APPARATUS FOR PERFORMING A THREADING OPERATION ON A ROTATING WORKPIECE

Hymie Cutler, Detroit, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed June 20, 1973, Ser. No. 371,813
Int. Cl. B23b *1/00, 5/46*
U.S. Cl. 82—1 C **12 Claims**

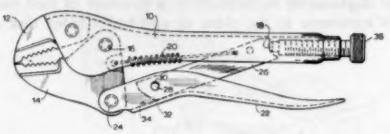


1. A method of operating an N/C machine tool comprising the steps of: reading blocks of coded data from an active record of tool displacements and machine functions; reading from said record at least one block containing a preparatory code for initiation of a cyclical program including the steps of causing a tool to be displaced into engagement with a rotating workpiece, causing displacement of the tool along the workpiece to machine the workpiece, withdrawing the tool from engagement with the workpiece, and repeating the tool displacement steps of engagement, machining, and withdrawal at cutting depths which increase incrementally within said limits; reading from the blocks containing said preparatory code and storing in a mass memory data defining limits of tool displacement within said cyclical program of tool displacements; and thereafter executing said cyclical program under the control of parameters stored in said memory and without reference to said active record.

3,854,354
PLIER TYPE TOGGLE WRENCH

Torsten F. Angquist, Jamestown, N.Y., assignor to Cooper Industries Inc., Houston, Tex.

Filed Nov. 19, 1973, Ser. No. 417,382
Int. Cl. B25b 7/12
U.S. Cl. 81—377 8 Claims



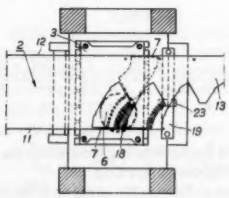
1. In a wrench of the type having a main handle-like body portion provided with a fixed jaw; a movable jaw pivotally mounted upon said body; a spring normally biasing said movable jaw toward open position relative to said fixed jaw; and a toggle mechanism operable for locking said jaws in closed condition upon a work-piece, said toggle mechanism including a lever handle pivotally connected to said movaole jaw and a toggle link having opposite ends thereof operably coupled to said lever handle and pivotally bearing upon a fulcrum device carried by said body;

the improvement wherein said toggle link is operably coupled to said lever handle by a pin-slot connection device and said link is provided with a cam surface arranged for engagement with a cam reaction surface portion of said lever handle when the latter is moved in one direction to a wrench-closed position and to simultaneously shift said toggle mechanism so as to arrange the pin of said pin-slot connection device substantially on the center line of said toggle mechanism whereby to frictionally lock said lever handle in said position whereat maximum jaw-locking strain is applicable upon a work-piece by the wrench parts.

3,854,355
METHOD OF PUNCHING SHEET SEGMENTS HAVING SUBSTANTIALLY ANNULAR SECTOR SHAPE

Gunnar Anefall, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 4, 1973, Ser. No. 403,721
Claims priority, application Sweden, Oct. 5, 1972, 12828/72
Int. Cl. B26f 1/40
U.S. Cl. 83—50 4 Claims

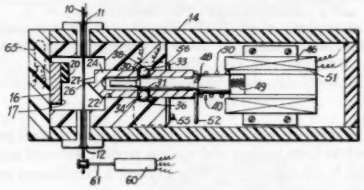


1. Method of punching sheet segments having substantially annular sector shape, intended to form the stator core in a turbo-generator, each segments lying within a sector angle of 40° – 80° and being limited by a back side (9), a slot side (10) and two radially oriented sides (7,8), said method comprising feeding a sheet metal strip (2) of constant width from a winder-recoiler (1) between the lower part (3) and the upper part (4) of a punching tool (5), the working profile of which tool corresponds to the shape of said sheet segments (6), and individually and successively punching out a plurality of sheet segments by said tool, the sheet metal strip (2) having a width which is larger than the air gap radius and smaller than twice the maximum outer radius of said stator core, the punching tool being oriented in such a way that a cutting edge of the tool corresponding to one of said radially oriented sides (7,8) is parallel to and almost coincides with a first longitudinal edge (11) of said sheet metal strip, a remaining portion of the sheet metal strip (13) which is located adjacent a second longitudinal strip edge (12) and which is not affected during the punching being moved out by the punching tool by the feeding movement, coiling such remaining portion on a winder-coiler (14) and feeding such remaining portion into the punching tool (5), said tool having such an orientation in relation to the sheet strip that said cutting edge is parallel to and substantially coincides with said second longitudinal sheet strip edge (12).

3,854,356
THREAD CUTTING AND CLAMPING MEANS

Richard Z. Okreglak, Washington, D.C., assignor to AMF Incorporated, White Plains, N.Y.

Filed July 17, 1973, Ser. No. 379,998
Int. Cl. B26d 5/08
U.S. Cl. 83—66 10 Claims



1. A device for cutting a strand of thread, yarn, or the like comprising,

means for guiding a strand along a path,

a cutting anvil located on one side of said path,

a translatable hollow barrel having cutting means at one end thereof,

a slideway disposed on the other side of said path and adapted to receive said barrel for permitting the barrel to slide from a latched position removed from said path to an unlatched position in which said cutting means is in engagement with said anvil,

spring means for sliding the barrel toward said path to bring the cutting means into contact with the anvil,

at least one aperture through the wall of said hollow barrel, detent means receivable within said aperture and radially movable with respect thereto,

a stem member disposed within said hollow barrel and axially movable with respect thereto between latched and unlatched positions,

said stem having first and second spaced portions of different thicknesses,

detent receiving means fixedly positioned exteriorly of said barrel for engaging said detent when the barrel is in its latched position,

said first stem portion being proportioned to contact the detent and urge it into engagement with the detent receiving means when the stem and barrel are in their latched positions,

the second stem portion being proportioned to engage the detent and permit its radial disengagement from the detent engagement means when the stem is in its unlatched position,

electromagnet means fixedly positioned relative to said stem,

armature means associated with said stem for moving the stem from its latched to its unlatched position upon energization of the electromagnet,

said aperture and detent means being constructed and arranged to move the detent into contact with the second stem portion when the stem is in its unlatched position.

3,854,357

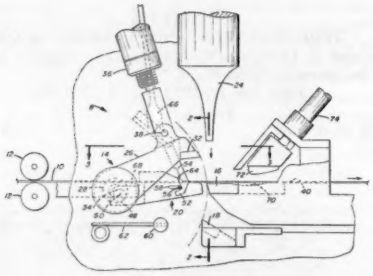
APPARATUS FOR REMOVING AN IMPERFECT PORTION OF A WEB

Martin W. Kron, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 290,605, Sept. 20, 1972, Pat. No. 3,799,826. This application Nov. 14, 1973, Ser. No. 415,588

Int. Cl. B26d *7/18*

U.S. Cl. 83—105 **11 Claims**



1. In a severing apparatus for removing an imperfect portion of a web to form trailing and leading perfect web end portions adapted to be spliced together to form a continuous perfect web, the combination comprising:

web transport means;

means defining a perfect web path along which a web having an imperfect portion can be transported by said web transport means;

first severing means adjacent said perfect web path;

second severing means spaced from said first severing means to define a passageway therebetween through which said imperfect portion can be transported along an imperfect web path; and

third severing means movable from an initial to a final position and cooperable with said first and second severing means in succession during such movement for severing said web at opposite ends of said imperfect portion to form trailing and leading perfect web end portions respectively; and

web guiding means responsive to said third severing means for movement from a first position in which it guides the web along said perfect web path to a second position in which it guides said imperfect portion along said imperfect web path.

3,854,358

PROFILE STEEL CUTTER

Erwin Kruse, Gevelsberg, Germany, assignor to Werner Peddinghaus, Sprockhovel-Hasslinghausen, Germany

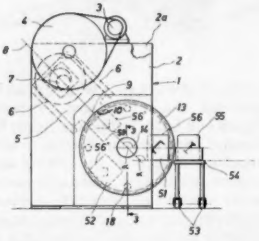
Filed Oct. 5, 1972, Ser. No. 295,121

Claims priority, application Germany, Oct. 6, 1971, 2149845The portion of the term of this patent subsequent to Aug. 7, 1990, has been disclaimed.

Int. Cl. B23d *23/00*

U.S. Cl. 83—198 **3 Claims**

1. A profile steel cutter which includes in combination: a rectilinearly movable tool carriage, a rotatably and adjustably mounted turret index disk having a plurality of sets of recesses, said sets of recesses being circularly arranged in spaced relationship to each other, a plurality of stationary cutting blade means stationary with regard to said turret index disk, a plurality of cutting blade means movable relative to said stationary cutting blade means and respectively forming with said stationary cutting blade means sets of cutting blade means which are interchangeable and are removably arranged in said sets of recesses during operation, locking means for arresting said turret index disk at each respective adjusted position with one set of blade means operative by said tool carriage and with a recess having another set of blade means opening laterally for removal of said set of blade means therein, and a magazine table displaceable horizontally in a direction of feed movement transverse to the plane of said turret index disk and



arranged adjacent said turret index disk at substantially the level of the axis of rotation of said turret index disk and of said one of said recesses opening laterally, said magazine table being adapted to receive and support sets of cooperating cutting blade means, said sets being arranged one behind the other when looking in the direction of feed movement of said magazine table, said sets and recesses in said turret index disk defining an angle with each other corresponding to the angle defined by the longitudinal axis of said carriage with the cutting blade supporting surface of said magazine table.

3,854,359

APPARATUS FOR ENABLING AUTOMATIC FEED FOR A PRESS WITH ONE-STAMPING DIE

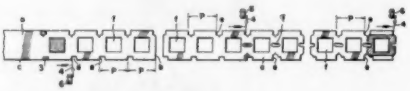
Shuji Tagami, Uozu, Japan, assignor to Kabushiki Kaisha Tagami Kanagata, Uozu-shi, Japan

Filed Mar. 16, 1973, Ser. No. 341,932

Claims priority, application Japan, June 7, 1972, 47-57164; June 15, 1972, 47-60210; Mar. 18, 1972, 47-33035[U]

Int. Cl. B26f *1/12*

U.S. Cl. 83—212 **2 Claims**



1. An apparatus for automating feed in a press having a ram and a one-stamping die comprising

punching means to form dents along an edge of the material fed to the press with descent of said ram,

said punching means being disposed at the material feed side of said die,

a pitch determining means disposed at the discharge side of said die and arranged to be engaged or held against either the leading end of the material or an edge spaced at one pitch intervals but released from the engaged or held condition simultaneously with the descent of said ram,

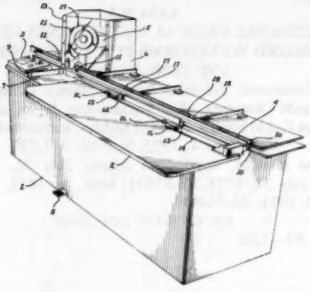
a control means to detect completion of each material positioning for punching work and issue an operating instruction to said ram,

and feed rollers provided on both feed and discharge sides of the press and powered by their own power sources.

3,854,360
SELF-GAUGING MITRE SAW

James C. Reed, San Diego, Calif., assignor to Manufacturing Approaches & Total Concepts, Inc., San Diego, Calif.

Filed Feb. 16, 1973, Ser. No. 333,383
Int. Cl. B27b 27/10, 5/20
U.S. Cl. 83—468 5 Claims



1. A self-gauging mitre saw apparatus mounted upon a work table for cutting molding to a length equivalent to the distance between opposing first and second sides of a pattern piece, said apparatus comprising in combination:

a. a channel secured to the work table for receiving a length of molding;

b. a vertically movable dual cut mitre saw assembly having a pair of cutting blades set at an angle of 90° with respect to one another, said cutting blades being at angles of 45° and 135°, respectively, with respect to said channel, said saw assembly being selectively movable in the vertical axis to intersect said channel;

c. an upwardly extending reference point fixedly attached to the work table in proximity to said saw assembly for defining the position of the first side of the pattern piece;

d. a slideable gauge plate having a gauge extending lateral therefrom, said gauge plate being slideable parallel to said channel to position said gauge adjacent the second side of the pattern piece; and

e. a stop disposed within said channel for limiting the length of molding to be cut by said saw assembly, said stop being secured to said gauge plate and slideable therewith within said channel; whereby, the gauge plate automatically determines the length of molding to be cut to conform with the distance between the first and second sides of the pattern piece.

3,854,361
QUICK CHANGE LABELING HEAD

Dean S. Kercher, Woodstock, and Trygve R. Rod, Mundelein, both of Ill., assignors to Xerox Corporation, Stamford, Conn.

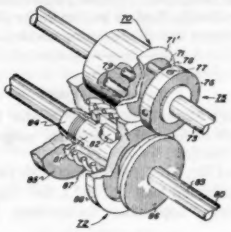
Division of Ser. No. 153,313, June 15, 1971. This application Division of Ser. No. 153,313, June 15, 1971, Pat. No. 3,774,489. This application June 25, 1973, Ser. No. 372,877 June 25, 1973, Ser. No. 372,877
Int. Cl. B23d 19/06; B26d 1/24
U.S. Cl. 83—499 4 Claims

1. As a means to expedite changeover of an addressing machine labeling head from one size label form to another size label form, said labeling head including a knife pair for removing the label form margins in preparation for use of the form labels, the combination of:

means supporting at least one of said trim knives for adjusting movement relative to the other of said trim knives whereby to permit the relative spacing between said trim knife pair to be adjusted for the label form being used;

locating means disposed adjacent said one trim knife in a preset locating position; and

indexable gauge means adjacent said locating means and engageable therewith to position said one trim knife relative to said locating means and thereby locate said one trim knife relative to the other trim knife, said gauge means having spacing surfaces of predetermined dimension at each index position thereof corresponding to different ones of said label forms for engagement with

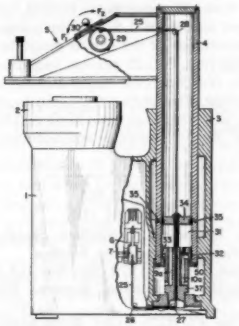


said locating means whereby to enable said one trim knife to be expediously positioned for the specific label form being used.

3,854,362
HYDRAULIC CONTROL SYSTEM FOR HOLLOW PUNCHING MACHINES

Emiliano Cantella, Vigevano Pavia, Italy, assignor to Atom di Cantella-Deambrosis & Gaia, Viegevano-via Ristoria, Italy

Filed Aug. 22, 1972, Ser. No. 282,689
Claims priority, application Italy, Aug. 22, 1972, 27735/72
Int. Cl. B26d 5/12
U.S. Cl. 83—530 10 Claims



1. In a punching machine having an overhanging head, a movable column vertically movable for lowering said head from a raised position and raising said head to said raised position, a hydraulic cylinder for reciprocable driving of said column means defining a hydraulic circuit for providing fluid under pressure to said cylinder for lowering and raising said head, an electrical control circuit, the improvement which comprises a valve in said hydraulic circuit for controlling application of hydraulic fluid to said cylinder maintaining said head in a raised position and for selectively lowering and raising said column thereby lowering and raising said head, said valve comprising a valve body and a valve spool reciprocable therein controlling flow of fluid under pressure into said cylinder for lowering and raising said head, said valve spool having an axial extension actuated under control of said control circuit for effecting travel of said spool for control of application of hydraulic fluid under pressure to said cylinder for lowering the column, means connected to said head and to said valve spool displacing said spool in a direction, as said column is raised, for controlling flow of hydraulic fluid under pressure to said cylinder for regulating the speed of raising said column and maintaining it in said raised position, adjust

means coactive with said means connected to said head and to said valve spool for variably adjusting the position of said spool relative to said valve body thereby variably setting the raised position of said column and said head, and said valve body and said spool each having a plurality of coacting, axially spaced annular lands defining flow paths controlling application of said hydraulic fluid to said cylinder for lowering and raising said column thereby lowering and raising said head.

3,854,363
CHAIN SAW UNIT

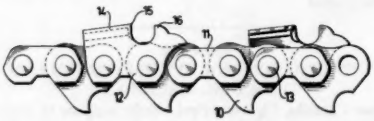
Karl Ake Bengt Merkell, and Jan-Christer Henric Ovesson Carlsen, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandvik, Sweden

Continuation of Ser. No. 23,807, March 30, 1970, abandoned. This application May 21, 1973, Ser. No. 362,248

Claims priority, application Switzerland, Mar. 31, 1969, 4482

Int. Cl. B27b *33/14*

U.S. Cl. 83—834 **7 Claims**



1. A saw chain link, in heat-treated and hardened condition, for a saw chain of a motor-driven chain saw, said link being made of a low alloy steel with good working qualities and at the same time having very high toughness, sharpness-permanency and wear-resistance, said low alloy steel being composed of, in weight percentages: 0.60–0.7 percent carbon, 0.9–1.4 percent silicon, 0–1.5 percent manganese, 0.3–0.7 percent chromium, one of the metals molybdenum and tungsten, 0.1–0.5 percent, 0–0.25 percent vanadium, 0–0.20 percent aluminum, 0–0.3 percent nickel and the remainder iron and normally present impurities, the microstructure of the link being bainitic, and which has been hardened by being heated at 850°–950° C. for 3–15 minutes and quenched in a salt bath at 280°–330° C.

3,854,364
SAW BLADE

Erik Wilhelm Sundstrom, Sandviken, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Filed Nov. 23, 1973, Ser. No. 418,220

Claims priority, application Sweden, Nov. 23, 1973, 16984/73

Int. Cl. B27b *33/08*; **B23d** *61/02*

U.S. Cl. 83—835 **6 Claims**

1. In a circular metal saw blade including a base plate having cutting elements at its peripheral edge and a covering plate concentrically assembled to said base plate by gluing, the improvement according to which circularly extending indentations are imparted to the covering plate, each said indentation extending concentrically with respect to the center of said plate assembly.

3,854,365
ELECTRONIC MUSICAL INSTRUMENTS READING MEMORIZED WAVEFORMS FOR TONE GENERATION AND TONE CONTROL

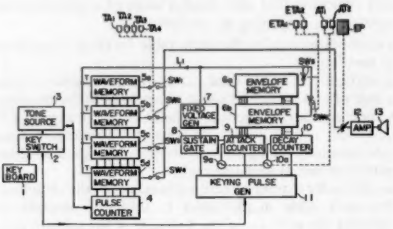
Norio Tomisawa; Takehisa Amano; Yasuji Uchiyama, and Takatoshi Okumura, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed Apr. 4, 1973, Ser. No. 347,725

Claims priority, application Japan, July 31, 1971, 46-57830; July 31, 1971, 46-57831; Sept. 16, 1971, 46-71245; Sept. 22, 1971, 46-73441

Int. Cl. G10h *1/00, 5/06*

U.S. Cl. 84—1.01 **14 Claims**



1. In an electronic musical instrument, a sound waveform producing system for producing sound waveforms by scanning stored waveforms comprising:

a tone source means including a plurality of clock pulse generators for generating a plurality of sound frequencies,

key-operated switches coupled to said clock pulse generators, each of said switches being assigned to a sound frequency,

a waveform memory means for storing a plurality of sampled representations of a sound waveform, said memory including a bank of voltage divider circuits, said voltage divider circuits including a bank of resistor elements having predetermined resistance values representing in analog form the desired waveform amplitude at each of a plurality of sampling points of said waveform, and a common resistor connected in series with said bank of resistors, and switching means for rendering the respective voltage divider circuits operative and inoperative,

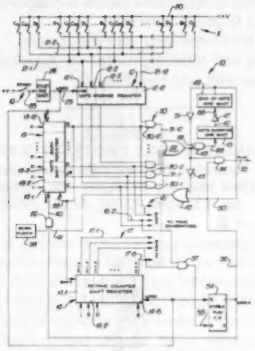
read-out means connected to said waveform memory means and including frequency divider circuits operable to read out said memory at selectable rates, and

coupling means for coupling said tone source means to said read-out means, said coupling means being operable to determine, in accordance with the pulse frequencies gated by keyed ones of said switches, the frequency divider circuits to be inputed with the selected pulse train from the clock pulse means so that the total number of the enabled read-out means is decreased with an increase in the frequency of the output signal to be produced.

3,854,366
AUTOMATIC ARPEGGIO

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka-ken, Japan

Filed Apr. 26, 1974, Ser. No. 464,363
Int. Cl. G10h *1/00, 5/00*
U.S. Cl. 84—1.24 **22 Claims**



1. Apparatus, useful in conjunction with an electronic musical instrument, for producing arpeggio and like effects, comprising:

a note storage device containing note-selection signals indicative of an arpeggio chord,

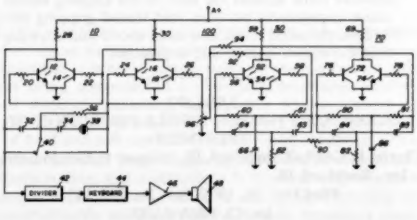
note scanning means for repetitively sequentially scanning said note storage device, said scanning being suspended to permit tone production each time that a note-selection signal is detected in a scanned location of said note storage device, and

play direction means, operative upon detection of a note-selection signal, for directing said musical instrument to produce a tone, the note and octave of said tone being established respectively by the scanned location containing said detecting note-selection signal and by the number of times said storage device has been scanned repetitively.

3,854,367
DUAL VIBRATO SYSTEM

Donald C. Ryon, Carol Stream, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 4, 1973, Ser. No. 393,762
Int. Cl. G10h *1/04*
U.S. Cl. 84—1.25 **6 Claims**



1. A system for producing a non-sinusoidal vibrato signal having a periodic complex waveform, comprising:

a first low frequency vibrato oscillator including a frequency determining circuit tuned to a first frequency for providing first oscillations having the first predetermined frequency;

a second low frequency vibrato oscillator including a frequency determining circuit tuned to a second frequency higher than said first frequency and a predetermined even multiple thereof for providing second oscillations having the second predetermined frequency;

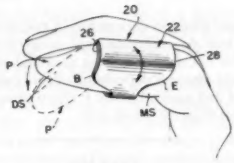
a coupling circuit connecting said first and second oscillators for synchronizing in phase locked relation said second oscillations to the predetermined frequency multiple of said first oscillations; and

a combining circuit connected to said first and second oscillators for receiving and combining said first and second oscillations, said combining circuit having an output terminal for providing said combined first and second oscillations to provide said periodic complex waveform.

3,854,368
FINGER MOUNTABLE GUITAR STRING CONTACT DEVICE

Leonard Pogan, 895 West End Ave., New York, N.Y. 10025

Filed Mar. 22, 1974, Ser. No. 453,859
Int. Cl. G10d *3/00*
U.S. Cl. 84—319 **12 Claims**



1. A device to be mounted on a finger for use in altering the vibration of a normally vibrating guitar string, said device comprising: string contact means extending at least partially around the circumference of a finger for contacting a vibrating guitar string; said string contact means having a longitudinal axis, a first end and a second end spaced circumferentially from said first end; said string contact means having a length along said longitudinal axis being a first value at said first end and being a second value, smaller than said first value, at said second end; means for snugly mounting said string contact means on the finger of a user so that said longitudinal axis is aligned with said finger; said mounting means and said string contact means being constructed and arranged to permit said string contact means first end to be selectively mounted in a use position on the ventral side of a user's finger, in a storage position on the dorsal side of a user's finger, and in a position on a user's finger intermediate said dorsal side and said ventral side.

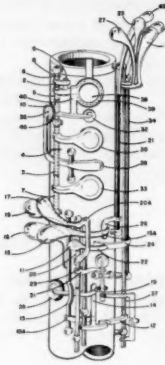
3,854,369
OBOE FINGERING SYSTEM AND MOUTHPIECE

Dick Paladino, 4221 San Bernardino Ave., Las Vegas, Nev. 89102

Division of Ser. No. 349,625, April 9, 1973, Pat. No. 3,789,721, which is a continuation-in-part of Ser. No. 234,481, May 15, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,029
Int. Cl. G10d *7/00*
U.S. Cl. 84—380 **1 Claim**

1. In a lower portion of an oboe or English horn, a key arrangement comprising an F natural key and tone hole cover therefor underlying an over ring positioned for depression by the first finger of the right hand, both of said tone hole cover and said over ring being attached to separate hinge tube segments, a second finger right hand ventless F sharp key and

tone hole cover therefor overlying an F natural tone hole, a tone hole cover overlying an F sharp tone hole located between the F natural and F sharp keys which cover is attached to said over ring and means connecting said second finger F sharp key with said F natural tone hole cover for depressing said F natural tone hole cover when said second finger F sharp



key is depressed wherein depression of said second finger right hand F sharp key also depresses said underlying F natural tone hole cover but not said over ring and said attached F sharp tone hole cover whereas depression of said over ring depresses said F natural and said attached F sharp tone hole covers but not the second finger F sharp key.

3,854,370

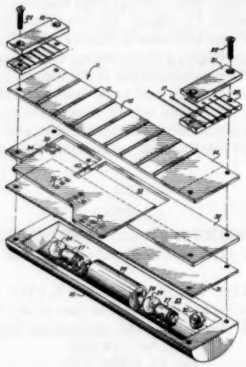
TRAINING AID FOR STRINGED MUSICAL INSTRUMENT

Stanley Sapinski, 1716 E. Wesleyan Dr., Tempe, Ariz. 85282

Filed May 1, 1974, Ser. No. 465,728

Int. Cl. G10b *15/00*

U.S. Cl. 84—485 **1 Claim**



1. A training aid for stringed instruments of the type having a neck and fingerboard, including guitars and mandolins, for assisting the player thereof in the proper placement of fingers on the fingerboard, said training aid comprising in combination:

a. a stringed instrument neck;

b. a fingerboard carried by said neck including

i. an elongate light transmitting substrate spaced from said neck,

ii. a plurality of spaced transverse frets upon the outer surface of said substrate, and

iii. a plurality of spaced strings extending longitudinally of said substrate over said frets;

c. a fingering indicator including

i. a plate insertable between said neck and said substrate carrying illuminatable indicia corresponding to a preselected fingering pattern;

d. means for illuminating said indicia, and

e. locating and retaining means for registering said chord indicator with said fingerboard.

3,854,371

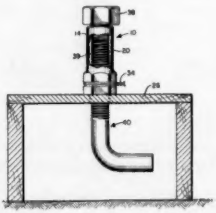
ANCHOR BOLT PROTECTIVE CAP

Surgules M. Lamothe, 1813 Feronia St., Metarie, La. 70005

Filed May 10, 1973, Ser. No. 359,020

Int. Cl. F16b *35/00, 37/00, 39/20*

U.S. Cl. 85—1 R **28 Claims**



1. A combination which comprises:

a. an anchor bolt having a threaded shank;

b. a template to position the anchor bolt in a selected locus, the template having an aperture therethrough to accommodate said threaded shank;

c. radially yieldable capping means having a bore therein adapted to receive and encase an end portion of said threaded shank, the interior of said means having thread gripping means around said bore, the top of the capping means having an upwardly extending, threaded stud sized to receive a nut which fits the threaded shank, said capping means having an elongate upwardly extending slot in a sidewall thereof; and

d. clamping means; the threaded shank of the anchor bolt extending upwardly through the aperture of the template and into the bore of the capping means supported on the template with the base of said capping means resting and supported on or above the upper surface of said template, and the clamping means being positioned around the lower portion of the capping means and applying a constrictive force around the bore of the capping means to cause engagement between said thread gripping means and the threaded shank at a locus above said aperture so that the anchor bolt is held in position.

3,854,372

SCREW ADAPTED FOR VISIBLE INSPECTION OF TIGHTNESS

Charles E. Gutshall, Rockford, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

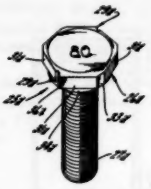
Filed Oct. 20, 1972, Ser. No. 299,347

Int. Cl. F16b *31/02*

U.S. Cl. 85—61 **37 Claims**

1. A one-piece screw adapted to be threaded into a workpiece by a tool to a predetermined torque, said screw including an elongated threaded shank, a head integrally formed on one end of said shank and shaped for engagement by said tool,

a weakened swageable portion of malleable material integrally formed with said head and having a predetermined strength correlated with said predetermined torque, a generally flat, external, tool-engaging face on said portion for abutting engagement by the tool to tighten the screw in the workpiece, and a recess within said head adjacent said portion to receive said portion and having a volume at least as great as the volume of said portion, said recess weakening said portion in



torsion and said portion being swaged generally toward the central axis of said screw and into said recess without breaking loose from said head as the tightening torque applied to said portion exceeds said predetermined strength thereby providing visual evidence of tightening the screw in the workpiece to said predetermined torque and to cause the tool to slip in engagement with said weakened portion to prevent the screw from being tightened excessively in the workpiece.

3,854,373

EXPANSION ANCHOR

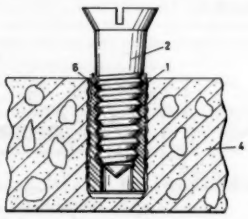
Ingo Romey, Essen, Germany, assignor to Bergwerksverband GmbH, Essen, Germany

Filed Dec. 12, 1972, Ser. No. 314,438

Claims priority, application Germany, Dec. 13, 1971, 2161717

Int. Cl. F16b *13/14*

U.S. Cl. 85—82 **8 Claims**



1. An expansion anchor, comprising a tubular expansion anchor sleeve having substantially smooth outer and inner surfaces and a bore of substantially constant diameter, said sleeve being composed of a plastically deformable carbon-based material, including substantially 65–75 percent by weight of particulate matter selected from the group consisting of hard and soft coal, 15–30 percent by weight of a first substance selected from the group consisting of natural and synthetic rubber, and substantially 5–10 percent by weight of a second substance selected from the group consisting of polyvinylchloride and polyethylene; and an expansion member having at least partly a diameter greater than said diameter of said bore of said expansion anchor sleeve and insertable into said bore for causing expansion of said expansion anchor sleeve.

3,854,374

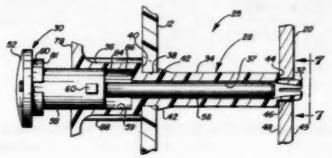
QUICK-RELEASE STANDOFF AND SUPPORT DEVICE

Jamie N. Boyle, and Edmund C. Decker, Jr., both of Phoenix, Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed May 29, 1973, Ser. No. 364,990

Int. Cl. F16b *13/04*

U.S. Cl. 85—84 **1 Claim**



1. A threadless plastic support device for detachably mounting a panel member to a structural member at a predetermined distance therefrom, said device being attachable in an aperture of the structural member, said device comprising:

a body member and a locking pin carried slidably in said body member;

said body member including a head, a fastener, a spacer arranged axially between the head and the fastener, and a central passage extending through said body member for receiving said locking pin;

said body member insertable in a hole formed in the panel member, the head having a face of greater cross-sectional dimension than the spacer so that the face abuts one surface of the panel member, the spacer passing through the hole and extending for said predetermined distance laterally beyond the surface opposite said one surface;

first means on the spacer for retaining said body member securely in the panel member hole, and further means on the spacer proximate to the fastener and located said predetermined distance along said spacer from said retaining means, said further means engaging one surface of the structural member when the fastener is inserted in the aperture of the structural member, so that said one surface of the structural member is spaced said predetermined distance from said opposite surface of the panel member;

the fastener depending from the spacer and formed in the shape of a grommet having an external wall and an internal wall defining the portion of the central passage traversing the fastener, and fastener having at least one transverse slot segmenting the grommet;

said locking pin including an actuating member with a cylindrical shaft depending therefrom, the actuating member being external of the head, the shaft slidably engageable in the passage traversing the fastener by applying an external force to the actuating member;

a guide on said locking pin receivable in a keyway formed in said body member, the guide and the keyway cooperating to slidably interlock said body member and said locking pin;

the fastener, prior to engagement of the shaft therein, being insertable in and through the aperture of the structural member, the internal wall of the fastener tapered to form a chamber of gradually decreasing size receiving the shaft, the tapered internal wall wedgedly engaged by the shaft to distend the slotted grommet radially outward to frictionally engage and grip the structural member in the aperture thereof and lock said device to the structural member, the spacer holding the panel member fixedly spaced said predetermined distance apart from the structural member; and

means for disengaging the shaft from the fastener, including means for limiting the transverse movement of the shaft within the passage of the body member.

3,854,375

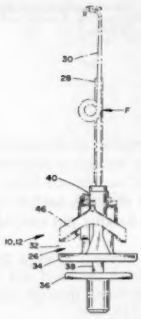
NOISE ATTENUATING BRAIDER CARRIER

James F. Lefevre, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Nov. 12, 1973, Ser. No. 415,045

Int. Cl. D04c *3/18*

U.S. Cl. 87—55 **2 Claims**



1. In a braiding apparatus of the type having a generally planar deck with two out-of-phase generally sinusoidal and concentric grooves formed therein, a plurality of strand carriers slidably mounted to operate in the grooves, and means to advance the carriers in timed relation in the grooves, the improvement in the carriers comprising:

a resilient polymeric body having upper and lower portions, the lower portion including two oppositely facing generally parallel flat portions spaced apart with a generally flat web portion, the flat portions interfacing the planar deck and the web portion slidably mounted and guided by the sinusoidal grooves, the flat portions in combination with the web portion defining a first compliant section in said body, the upper portion including upwardly extending generally parallel spaced mounting portions defining a second compliant section therebetween;

a bobbin spindle removably attached to one mounting portion, the bobbin spindle, mounting portion, and first and second compliant sections having a combined deflection capability of generally 0.07 to 0.1 inch per pound of force laterally applied to near the mid-point of the bobbin spindle; and

a strand guide removably attached to the other mounting portion, the bobbin spindle and strand guide extending upwardly in generally parallel fashion, the strand guide, strand guide mounting portion, and first and second compliant sections having a combined deflection capability of generally 0.25 to 0.75 inch per pound of force laterally applied to near the mid-point of the strand guides; and

means for tensioning strands mounted to the upper body portion;

the first and second compliant sections in combination defining a strand dampening means for controlling strand tension in cooperation with the strand tensioning means; whereby the first compliant section in association with the deck dampens audible vibrations as the carrier is advanced on the deck.

3,854,376

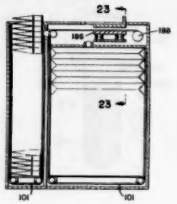
LIQUID PROPELLANT WEAPON

Lester C. Elmore, Portola Valley, and Thomas M. Broxholm, Palo Alto, both of Calif., assignors to Pulsepower Systems Inc., San Carlos, Calif.

Division of Ser. No. 179,759, Oct. 13, 1971, Pat. No. 3,803,975. This application Oct. 23, 1973, Ser. No. 408,570

Int. Cl. F41c *25/00*

U.S. Cl. 89—33 B **4 Claims**



1. A magazine for a liquid propellant gun of the kind in which liquid propellant is pumped into a combustion chamber and ignited to fire a projectile from the gun, said magazine comprising a stack of projectiles, a tank of liquid propellant and an elevator lift mechanism for raising the stack of projectiles and for raising the bottom wall of the tank of liquid propellant to feed the projectiles and liquid propellant to the gun when the magazine is associated with the gun.

3,854,377

TANK TURRET FOR AUTOMATIC WEAPONS

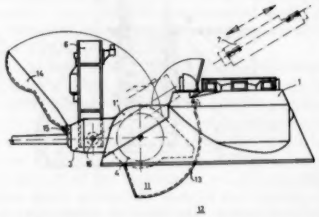
August Schiele, Augsburg, Germany, assignor to Keller & Knappich Augsburg Zweigniederlassung der Inudstrie-Weike Karlsruhe Augsburg Aktiengesellschaft, Augsburg, Germany

Filed Apr. 11, 1973, Ser. No. 350,234

Claims priority, application Germany, May 20, 1972, 7219032

Int. Cl. F41f *21/06, 23/10*

U.S. Cl. 89—36 K **4 Claims**



1. A housing for automatic weapons used in supporting a cannon comprising in combination:

a turret body having a removable portion;

a pair of trunnions disposed in said turret body;

a weapon carrier pivotably supported in and disposed between said pair of trunnions;

a weapon mount pivotably supported in said weapon carrier, said weapon carrier further comprising a rotatable plate pivotable about the front of said weapon carrier allowing access to the cannon;

separable bearing support means supporting the trunnions perpendicularly to the fixed turret axis, said separable means having an upper half and a lower half, the upper half being affixed rigidly to said turret's removable por-

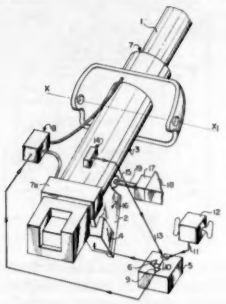
tion, the lower half being affixed rigidly to said turret body; and

means for detachably securing said turret's removable portion to said turret body so that the cannon may be removed from the housing by separating said turret's removable portion from said turret body.

3,854,378
DEVICE FOR STABILIZATION OF AN OSCILLATING MASS

Jean-Luc Vogel, Meudon, France, assignor to Republic of France as represented by the State Minister charged with National Defence, Delegation Ministerielle pour l'Armement, Paris, France

Filed July 9, 1973, Ser. No. 377,288
Claims priority, application France, July 7, 1972, 72.24598
Int. Cl. F41f *21/16;* **F41g** *5/16, 5/24*
U.S. Cl. 89—37 F **4 Claims**



1. In combination with an oscillating mass pivotally mounted with two degrees of freedom on a moving frame, a stabilization device comprising means for transmission of torque to the oscillating mass, said means comprising a metallic sector carried by said oscillating mass at one of its ends and constituting the rotor of a stabilizing torque producing drive with very low viscosity whose stator is integral with the frame and constitutes the inductor, and means for automatic correction of systemic and random imbalances comprising a mass transfer device mounted directly on the mass to be stabilized.

3,854,379
TOROIDAL SURFACE PROCESSING MACHINE

Francis Vass, and Dezideriu Horacek, both of Brasov, Romania, assignors to Uzina de Autocamioane Brasov, Brasov, Romania

Filed Aug. 21, 1972, Ser. No. 282,551
Int. Cl. B23c *3/16, 3/34*
U.S. Cl. 90—15.1 A **9 Claims**

1. An apparatus for milling ball seats into a constant-velocity ball-coupling half comprising:

a support;

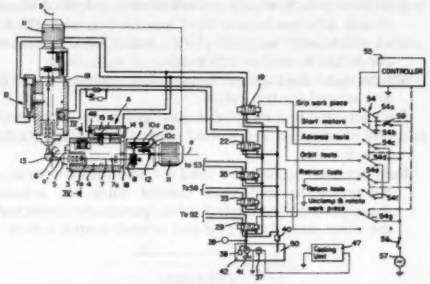
means on said support to displace a first tool parallel to a first axis;

means on said support for orbiting said first tool about said first axis;

means on said support for displacing a second tool parallel to a second axis intersecting said first axis;

means on said support for orbiting said second tool about said second axis; and

clamping means on said support for holding a coupling-half blank at the intersection of said first and second axes and for rotating said blank through 180° about a third axis transverse to and intersecting said first and second axes, each of said means for orbiting including a spindle rotatable about the respective axis, said tool being mounted eccentrically on said spindle, a toothed sector provided on said spindle, a rack piston meshing with said sector,

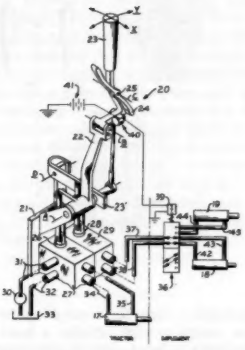


and cylinder means for displacing said piston to rotate said spindle.

3,854,380
THREE-WAY LEVER CONTROL FOR HYDRAULIC CONTROL CIRCUIT

Robert Casey, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 265,427, June 23, 1972, Pat. No. 3,795,280. This application Sept. 24, 1973, Ser. No. 399,987
Int. Cl. F15b *11/16*
U.S. Cl. 91—413 **2 Claims**



1. A hydraulic control circuit comprising

a three-way lever control adapted to actuate separate valves comprising

a stationary support,

an articulated handle having a first arm, adapted to actuate a first valve, pivotally mounted on said support for pivotal movement about a first axis,

a second arm, adapted to actuate a second valve, pivotally mounted on said first arm for pivotal movement about a second axis disposed transversely relative to said first axis, and

a third arm, adapted to actuate a third valve, pivotally mounted on said second arm for pivotal movement about a third axis,

first and second control valves each having a stem reciprocally mounted therein,

means pivotally interconnecting each of said first and second arms with a respective one of said valve stems whereby pivotal movement of said handle about said first axis will reciprocate one of said valve stems and pivotal

movement of said handle about said second axis will reciprocate the other one of said valve stems,

electrical switch means mounted on said second arm, closely adjacent to said third arm for actuation thereby, an electrically actuated third control valve operatively connected to said switch means,

a pressurized fluid source operatively connected to said first and second control valves,

fluid actuated first cylinder means operatively connected to one of said first and second control valves for actuation thereby, and

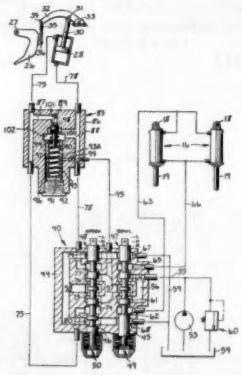
fluid actuated second and third cylinder means operatively connected to said third control valve for actuation thereby, said third control valve operatively connected to the other one of said first and second control valves.

3,854,381

RELIEF VALVE SYSTEM FOR A SCRAPER APRON

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 4, 1974, Ser. No. 439,216
Int. Cl. F15b *11/16, 13/06*
U.S. Cl. 91—414 **7 Claims**



1. In a hydraulic system for controlling the bowl and apron of a scraper, which system includes a bowl lift cylinder, an apron lift cylinder, a bowl control spool valve connected by bowl cylinder conduits to the head end and to the rod end of said bowl lift cylinder and controlling admission of hydraulic fluid to said conduits; an apron control spool valve connected by apron cylinder conduits to the head end and to the rod end of said apron lift cylinder and controlling admission of hydraulic fluid to said apron cylinder conduits, and a high flow rate pressure relief valve for returning hydraulic fluid from said system to a reservoir, pressure relief means for the rod end of the apron lift cylinder comprising, in combination:

a relief valve housing that has an inlet passage connected to the apron cylinder conduit for the rod end of the apron lift cylinder and an outlet passage;

a valve member in said housing that controls the passage of hydraulic fluid from the inlet passage to the outlet passage;

means biasing said valve member to a closed position with a predetermined force so that a first predetermined pressure in the inlet passage is required to open said valve;

a signal conduit connecting said housing to the apron control spool valve;

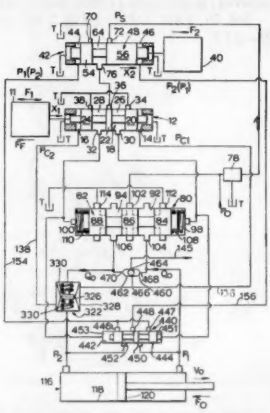
and means responsive to increased pressure in said conduit to increase the force applied to said valve member by the biasing means and thereby require a second, and higher predetermined pressure to open said valve member.

3,854,382

HYDRAULIC ACTUATOR CONTROLS

Ronald Bernard Walters, Wembley, and Peter Michael Hamey, Emsworth, both of England, assignors to Sperry Rand Limited, London, England

Filed June 20, 1973, Ser. No. 371,861
Int. Cl. F15b *11/10, 13/043*
U.S. Cl. 91—433 **10 Claims**

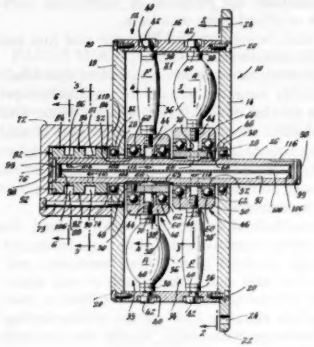


1. A device for controlling the pressure of fluid applied to a double acting hydraulic actuator responsively to an electrical input signal comprising fluid pressure operated main control valve means for regulating the fluid flow to and from the actuator, pilot valve means for controlling the main control valve means, said pilot valve means including spool means for regulating the fluid pressures for operating the main control valve means, transducer means for producing a first force dependent upon said electrical input signal and for applying said force to said spool means, piston means associated with said spool means and comprising substantially equal piston areas effective in opposite directions, and feedback means including shuttle valve means responsive to the direction of actuator movement against a load, said shuttle valve means comprising a housing having inlet ports and outlet ports and containing opposed pressure chambers, and a valve piston movable in said housing responsively to pressures in said opposed pressure chambers, said feedback means further including conduit means connecting said shuttle valve inlet ports to opposite sides of said actuator and conduit means connecting said opposed pressure chambers to a fluid outlet of said pilot valve means to connect the inlet ports alternately to the outlet ports such that one of the outlet ports is always subjected to the operating pressure at the side of the double acting actuator being supplied with fluid and the other is always subjected to the operating pressure at the side of the double acting actuator from which fluid is being withdrawn, said feedback means further comprising feedback conduit means connecting said shuttle valve outlet ports to said opposed piston areas for applying to said opposed piston areas a pressure differential dependent upon the magnitude of the fluid pressure difference operating on the actuator to apply to said spool means a second net force opposed to said first force.

3,854,383
TENSION ACTUATED PRESSURIZED GAS DRIVEN ROTARY MOTORS

Henry M. Paynter, Reading, Mass., assignor to Dynacycle Corporation, Cambridge, Mass.

Filed Dec. 26, 1972, Ser. No. 318,432
Int. Cl. F01b *13/04, 3/10*
U.S. Cl. 91—492 23 Claims



1. A tension actuated, pressurized fluid driven rotary motor for producing continuous rotary motion comprising:

motor frame means, a shaft mounted for rotation relative to said frame means,

a plurality of pressurized fluid driven tension actuators, longitudinally contractible upon inflation with pressurized fluid,

means for mounting said tension actuators about the axis of said shaft,

connecting drive means for linking said tension actuators to said shaft with the axis of said connecting drive means offset with respect to the longitudinal axis of said shaft,

fluid distribution inlet and exhaust means including inlet and exhaust port means, inlet and exhaust intermediate fluid conducting means, and distributor means for sequentially distributing pressurized fluid to and exhausting fluid from each of said tension actuators to cyclically inflate and deflate each of said tension actuators for applying contraction tension forces to said offset connecting drive means to rotate said shaft and frame means relative to each other,

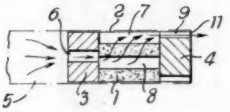
said distributor means comprising a collector ring member having a central axial bore, and plurality of radial fluid passageways disposed therein, said tension actuators being fixedly attached to said collector ring member with each of said radial passageways communicating with one of said tension actuators, and

a distributor hub member, rotatably disposed with respect to said central axial bore of said collector ring member, having valving inlet and exhaust passages communicating with said inlet and exhaust intermediate fluid conducting means, respectively, for successively communicating with and distributing pressurized fluid from said inlet intermediate fluid conducting means to each of said tension actuators through said valving inlet passage, and for subsequently, successively communicating with and exhausting pressurized fluid from each of said tension actuators to said exhaust intermediate fluid conducting means through said valving exhaust passage, upon rotation of said distributor hub relative to said collector ring member.

3,854,384
METHOD OF MAKING TOBACCO SMOKE FILTERS

Donald B. Naylor, Dibden-Purlieu, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 245,357, April 19, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 414,988
Claims priority, application Great Britain, May 24, 1971, 16572/71
Int. Cl. A24c *5/50*
U.S. Cl. 93—1 C 9 Claims



1. A method of producing a radial-flow tobacco-smoke filter, which filter comprises a porous filter tube extending eccentrically and substantially longitudinally within an outer tubular wrapper whereby a crescent-shaped space is defined between said filter tube and said outer wrapper, a first closure element disposed at one end of the filter tube closing the crescent-shaped space between said filter tube and said outer wrapper, said first closure having an opening therein communicating with the interior of the filter tube, and a second closure element disposed at the opposite end of said filter tube sealing the filter tube, said method comprising the steps of:

A. depositing at least one first closure element and at least one second closure element, which closure elements have substantially equal exterior diameters, and at least one filter tube having an exterior diameter less than that of said closure elements upon a moving band, so that a filter tube is disposed between first and second closure elements and eccentric to the axes of said closure elements;

B. bringing said filter tube and said first and second closure elements into abutting relationship, and

C. enrobing said filter tube and said closure elements, with said filter tube eccentric to the axes of said closure elements, in a strip of wrapper material.

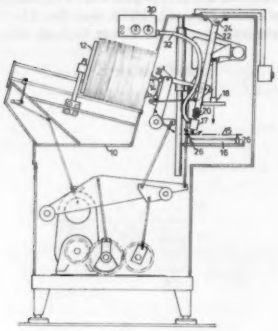
3,854,385
MACHINE FOR ERECTING AND GLUING CARTON BLANKS

Kay Arne Wallin, Halmstad, Sweden, assignor to Sprinter Pack AB, Halmstad, Sweden

Filed May 24, 1973, Ser. No. 363,644
Claims priority, application Sweden, June 1, 1972, 7191/72
Int. Cl. B31b *3/60, 1/62*
U.S. Cl. 93—36 MM 2 Claims

1. A machine for erecting planar carton blanks to form glued boxes comprising a shaping die for erecting the blanks and a ram for pressing said blanks against said die, and means having at least one nozzle for applying warm, liquid glue in strings or spots to the portions of the blank to be glued together, characterized in that from the machine frame above the die there is suspended a pivot arm which is pivotally mounted at its upper end on a pin which extends parallel with one of the two main directions of the die, which directions extend perpendicularly to each other, that the lower end of the arm supports a glue dispensing nozzle which is connected with a glue container via a conduit, that the nozzle is pivotable between two limit positions located in the region on opposite sides of the die, and that the length of the arm between the nozzle and the pivot pin of said arm is at least twice the dis-

tance between the limit positions of the nozzle, so that during the whole of its movement above a planar blank on the die the



nozzle is located at a small distance from the blank sufficient to apply glue.

3,854,386

AIR DIFFUSERS

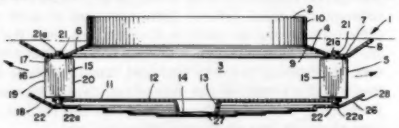
Warren R. Hedrick, Holland, Mich., assignor to Allied Thermal Corporation, New Britain, Conn.

Filed July 2, 1973, Ser. No. 375,449

Claims priority, application Great Britain, Feb. 13, 1969, 7880/69

Int. Cl. F24f *7/00*

U.S. Cl. 98—40 D **6 Claims**



1. A ceiling air diffuser comprising

a. A substantially square upper plate comprising

1. a substantially flat, horizontally extending peripheral edge portion

2. a second peripheral edge portion projecting upwardly and outwardly from the outer edge of said first mentioned peripheral edge portion,

3. a third peripheral edge portion projecting upwardly and inwardly from the inner edge of said final mentioned peripheral edge portion, and

4. a substantially annular air-inlet collar

a. attached to the inner edge of said third peripheral edge portion, and

b. projecting substantially vertically upwardly from the latter,

b. a second substantially square plate disposed in

1. downwardly spaced,

2. substantially parallel relation to said first mentioned peripheral edge portion,

c. a third substantially square plate

1. mounted below said second plate, and

2. having an outer peripheral edge portion

a. projecting outwardly beyond the outer peripheral edge of said second plate, and

b. disposed in downwardly spaced, substantially parallel relation to said second peripheral edge portion,

d. said first mentioned, second and third peripheral edge portions defining one side of a discharge passageway for discharging air, received from said air-inlet collar, outwardly from the peripheral edge of said plates,

e. said second plate and said outer peripheral edge portion of said third plate defining the opposite side of said discharge passageway, and

f. vanes mounted in said discharge passageway for controlling the flow of air therethrough,

g. said vanes each comprising

1. substantially flat blades having

a. oppositely disposed ends, and

b. two oppositely disposed edges extending between said ends, and

2. two reduced end portions projecting outwardly from substantially the midpoint of respectives ones of said ends to afford pivot members,

h. said vanes being disposed between said first mentioned and said second plates with

1. said pivot members on one end of said blades being rotatably mounted in said first mentioned peripheral edge portion of said first mentioned plate, and

2. said pivot members on the other end of said blades being rotatably mounted in the outer peripheral edge portion of said second plate for rotation of said vanes through 360° around the longitudinal center lines of the pivot members thereon, and

i. said longitudinal center lines being spaced from each other along respective sides of the square-shaped peripheral edge portions of said first mentioned and second plates that said vanes along each of said sides may be rotated around said pivot members thereon into and out of position effective to close the corresponding side of said discharge passageway against the discharge of air therefrom,

j. said vanes disposed along such a side, when they are disposed in said position thereof, being disposed in such position that said blades thereof are disposed in substantially uniplanar relation to each other with said oppositely disposed edges of adjacent ones of said blade disposed in closely adjacent, substantially abutting relation to each other.

3,854,387

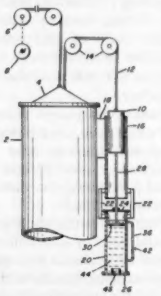
SAFETY SNUBBER FOR COUNTERWEIGHT

Steckle, Charles, McCandles Twp., Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed July 11, 1973, Ser. No. 378,369

Int. Cl. F23l *17/02*

U.S. Cl. 98—59 **4 Claims**



1. In a combination which includes a stack, a cap normally closing the upper end of said stack, lifting means connected to said cap for raising the cap from the stack, a counterweight mounted on said stack and support means connecting said counterweight to said cap whereby said counterweight assists said lifting means in raising said cap, the combination therewith comprising a hollow cylinder closed on one end and mounted on the stack, a piston loosely fitting inside said cylin-

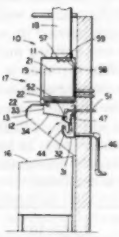
der, means connecting the counterweight to said piston for moving said piston as the counterweight descends, a by-pass line connected to said cylinder providing a passageway to the cylinder interior between a location near the closed end of the cylinder and another location near the outer end of the cylinder and a fluid in said cylinder whereby descent of the counterweight is controlled by the rate of flow of said fluid through said bypass line as said piston moves between the bypass connections and by the rate of flow of said fluid between said piston and the wall of said cylinder as said piston moves towards the closed end of said cylinder.

3,854,388

RANGE HOOD AIR CLEANING DEVICE

Donald E. King, Louisville, Ky., assignor to Ayr-King Corporation, Louisville, Ky.

Continuation-in-part of Ser. No. 378,566, July 12, 1973,. This application Sept. 13, 1973, Ser. No. 397,091
Int. Cl. B01d *47/06*
U.S. Cl. 98—115 K **1 Claim**



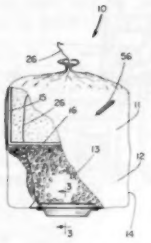
1. Range ventilating apparatus for removing grease vapors, odors, smoke and the like including a hood structure overhanging and spaced above a range cooking surface, said hood structure having a vertically extending box-like configuration with a forwardly extending upper portion, an elongated horizontal slot formed in the front face of said box-like hood structure below said extending upper portion, said slot being defined by a unitary tubular structure removably inserted into said box-like hood, one wall of said tubular structure being formed to provide an upper lip portion at the upper edge of said slot turned inwardly and downwardly within said hood and terminating above the base of said hood, the other wall of said tubular structure being formed to provide a lower lip portion at the lower edge of said slot, and outwardly directed horizontally extending flange provided along the lowermost margin of said upper lip portion and an inwardly directed horizontally extending flange provided along the uppermost margin of said lower lip portion, said horizontal flanges providing a passage of reduced area therebetween for air and fumes within the hood structure, a series of spray nozzles supplied with cooling water arranged along the rear surface of said upper lip portion and within the hood structure for directing a continuous water spray downwardly within said hood structure to impinge on the rear surface of said upper lip portion, whereby when the pressure within said hood structure is below atmospheric, air and fumes from the range surface are drawn through said slot and provided increased downwardly directed velocity by the proximity to each other of said horizontal flanges and are then reversed to flow upwardly through said hood structure, the water spray cooling said upper lip portion to prevent grease particles impinging thereon from being baked on the lip surface, and the removability of said unitary tubular structure permitting maintenance access to said spray nozzles and the interior of said hood structure.

3,854,389

APPARATUS FOR PRODUCING LIQUID COFFEE

Robert E. Hillemann, Indianapolis, Ind., assignor to Harold G. Crane, Carmel, Ill., a part interest

Filed Apr. 4, 1973, Ser. No. 347,816
Int. Cl. A47j *31/00*
U.S. Cl. 99—295 **9 Claims**



1. An apparatus for producing liquid coffee comprising:
a disposable first container having an openable top and a sealed bottom;
a partition mounted in said container dividing said container into a first compartment and a second compartment for receiving cold water, said partition being porous allowing said cold water to pass therethrough and into said second compartment;
coffee positioned in said second compartment with said container and said partition limiting movement of said coffee; and,
a filter mounted to said sealed bottom of said container;
supporting means mounted within said first compartment of said container and being operable to maintain the configuration of said first compartment of said container; and wherein:
said container includes plastic flexible side walls defining said first compartment and said second compartment, said side walls are prevented from inward collapse by said supporting means, said container further includes a plastic bottom wall joined to said flexible side walls.

3,854,390

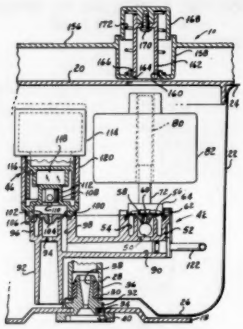
HYDROMAGNETIC WATER CONTROL FOR AUTOMATIC COFFEE BREWER

Harvey R. Krueger, Dundee, Ill., assignor to Reynolds Products, Inc., Schaumburg, Ill.

Filed Oct. 17, 1973, Ser. No. 407,300
Int. Cl. A23f *1/00, 1/08*
U.S. Cl. 99—307 **15 Claims**

1. Apparatus for controlling the flow of cold water into and the flow of hot water out of a storage tank of an automatic coffee brewer including in combination, a storage tank having inlet and outlet means, means including a normally closed inlet valve connected to said inlet means opening to admit cold water into said tank, means including a normally open outlet valve connected to said outlet means permitting hot water to flow out of said tank, a float carried in said tank being operatively connected to said inlet valve, said float being movable manually from a first position downwardly to a second position, means normally urging said float to said first position, means responsive to said manual movement of said float to said second position opening said inlet valve under the influence of said urging means, means for closing said outlet valve concomitantly with opening of said inlet valve, and

means responsive to movement of said float under the influence of incoming cold water moving said float to a third position and concomitantly closing said inlet valve and opening said outlet valve.



3,854,391

APPARATUS FOR USE IN PREPARING COOKED MEAT

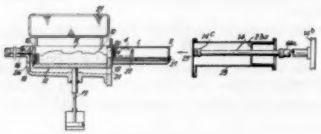
Harry Briggs Ackroyd, Bletchley, England, assignor to Scot Meat Products Limited, Bletchley, Milton Keynes, England

Continuation-in-part of Ser. No. 197,810, Nov. 11, 1971, abandoned, which is a division of Ser. No. 11,267, Feb. 13, 1970, Pat. No. 3,638,554. This application Apr. 27, 1973, Ser. No. 355,208

Claims priority, application Great Britain, Feb. 13, 1969, 7880/69

Int. Cl. A47j *27/20;* **B30b** *7/00*

U.S. Cl. 99—349 **9 Claims**



1. A meat press for use in preparing units of cooked meat of substantially uniform cross-section and quality, comprising a trough with an openable air-tight cover, said trough having outer and inner ends formed with aligned openings, means for supporting and securing a tubular container of comparable cross section to the trough in end to end alignment therewith and for preventing the ingress of air to said trough through said container, means to evacuate air from the trough and first ram means having a line of action extending through the trough from said outer end thereof and through said outer and inner ends for pushing a meat unit out of said trough through said inner end into a container, characterized by the provision of second ram means having a line of action extending through the position of a container supported on said supporting and securing means, said second ram means having a stroke of a length to extend substantially through an aligned container to a point adjacent said trough inner end for applying a counter pressure resisting movement of said first ram means to maintain meat being placed within a container under compressing by said ram means at substantially all times during pushing of a meat unit out of said trough into said container.

3,854,392

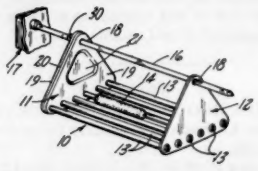
WIENER COOKER ATTACHMENT UNIT FOR ROTISSERIES

E. Craig Eason, 31323 W. Wind, Fraser, Mich. 48026

Filed May 7, 1973, Ser. No. 358,107

Int. Cl. A47j *37/04*

U.S. Cl. 99—421 H **14 Claims**



1. A rotisserie device to be driven by an elongated rotary rotisserie member, comprising a frame having means to non-rotatively suspend the same at an upper portion thereof from said member in dependent relation thereto despite rotation of the member, at least two elongated and parallel driven rollers mounted on said frame to cradle a wiener or like object to be broiled, and a driven unit carried by said frame, including an endless flexible power-transmitting member, a rotary member about which said flexible member is trained for drive, said rotary member being connectable to said rotary rotisserie member for rotation by the latter, and a plurality of rotary driven members across which said flexible power-transmitting member is passed for their drive, at least some of said driven members each being fixedly connected to an object-cradling roller to rotatively drive the latter.

3,854,393

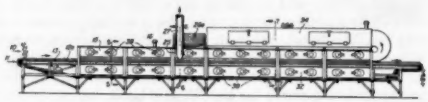
APPARATUS FOR PRODUCING PREPARED HASH BROWN POTATO PRODUCT

James T. Knight, and Glen R. Green, both of Ontario, Oreg., assignors to Ore-Ida Foods, Inc., Ontario, Oreg.

Division of Ser. No. 200,828, Nov. 22, 1971,. This application Jan. 22, 1973, Ser. No. 325,611

Int. Cl. A23b *7/06;* **A23l** *1/12*

U.S. Cl. 99—443 C **7 Claims**



1. Apparatus for producing potato shreds useful in the forming of a prepared hash brown potato product, comprising means for shredding raw potatoes; a perforate support arranged to receive the shredded raw potatoes as a loosely laid bed; and means for forcing a hot blanching fluid upwardly through said support and said bed under sufficient pressure and diffused velocity to maintain the individual potato shreds substantially separated during blanching thereof, the perforations of said support being sufficiently small and numerous to diffuse said fluid throughout said bed such that localized channeling thereof will be substantially prevented.

3,854,394

EGG LIQUID EXTRACTOR APPARATUS

Charles H. Willsey, Maple Hill, Kans., assignor to Seymour Foods, Inc., Topeka, Kans.

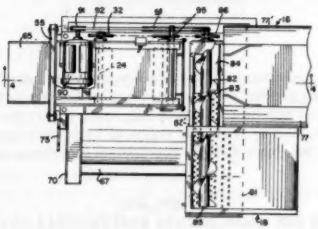
Filed Jan. 4, 1973, Ser. No. 321,000

Int. Cl. A23n

U.S. Cl. 99—495 **17 Claims**

1. An apparatus for crushing shell egg materials and separating the liquid from the shell particles which comprises an

endless traveling belt of substantial width mounted on spaced end rollers with its upper run in a generally horizontal plane so as to support material deposited thereon, an upper endless traveling belt also of substantial width mounted on spaced end rollers with a lower run in substantial vertical alignment and traveling in a plane inclined toward the leading end of the upper run of the bottommost belt and in the direction of advance of the opposed upper and lower runs so that there is substantial entrance space between the trailing ends of said upper and lower belt runs which space decreases to an area of contact between said upper and lower belt runs in the direction of advance thereof, means for driving the belts so that said upper and lower runs advance in the same direction, a



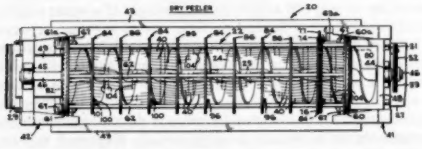
feed chute at the entrance to said opposed belt runs for depositing material onto the upper run of said bottommost belt, a drain pan for receiving liquid disposed beneath and extending beyond at least one side of said bottommost belt, and a discharge chute disposed at the end of said belt runs for receiving the shell particles discharged at the end of the upper run of the bottommost belt, said material fed onto the upper run of the bottommost belt being advanced between the contact of said upper and lower belt runs and the liquid portion of the material will be discharged over the sides of the upper run of said bottommost belt into said pan while shell portions will be crushed between said belt runs and carried into said discharge chute at the end of said upper run of said bottommost belt.

3,854,395

FLEXIBLE CABLE DRY PEELER

Katsuji Hirahara, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Feb. 12, 1973, Ser. No. 331,403
Int. Cl. A23n *7/02, 7/10*
U.S. Cl. 99—630 **6 Claims**



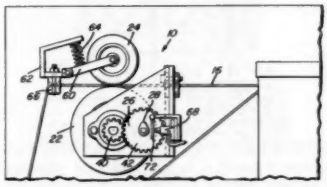
1. A peeler for generally spheroidal food products such as vegetables, potatoes or the like which have been treated to soften their skins for removal, said peeler being of the type that provides a rotary cage having an open abradant surface, means for rotating the cage, means for propelling the products longitudinally through the cage, means for feeding treated products to the cage, and means for removing peels that fall from the cage; the improvement wherein said cage comprises a pair of end support rings, at least one intermediate support ring and an abradant envelope formed of longitudinally extending, circumferentially spaced, straight briaded steel wire cables supported on said rings, means for tensioning said cables sufficiently to maintain their generally longitudinal direction under product load while accommodating sufficient deflection of the cables under product load to cause the cables to partially conform to the product contour and hence to provide an abradant, supporting contact of substantial longitudinal extent with the generally spheroidal products, said cables being spaced by a distance that is several times greater than the cable diameter.

3,854,396

TWINE MEASURING TRIP MECHANISM FOR BALERS

Donald A. Greytak, P.O. Box 1267, and Duane S. Sargent, 1146 Wilson Ave., both of Harve, Mont. 59501

Filed July 12, 1973, Ser. No. 378,388
Int. Cl. B65b *57/10*
U.S. Cl. 100—4 **7 Claims**



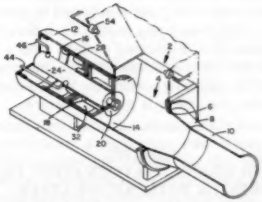
1. For use in a baler incorporating knotting apparatus and a twine supply, a twine measuring mechanism for actuation of the knotting apparatus in response to movement of a predetermined amount of twine, said, mechanism being positioned between the twine supply and the knotting apparatus for reception of the twine as it moves from the supply to the knotting apparatus, said mechanism comprising a twine measuring element engageable by the twine and movable in response to passage of the twine thereover, and control means operative in response to a predetermined movement of the twine measuring element to activate the knotting apparatus, said twine measuring element comprising a rotatably mounted measuring wheel engageable at a point on its periphery by the twine with the frictional engagement therebetween effecting a rotation of the wheel in response to movement of the twine.

3,854,397

REFUSE COMPACTING DEVICE

James W. Dempster, Knoxville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 18, 1972, Ser. No. 298,747
Int. Cl. B30b *11/22*
U.S. Cl. 100—41 **6 Claims**



6. A method of compacting refuse material, including:
the steps of supplying refuse material to be compacted to a compaction chamber;
driving a small high-pressure ram device into the refuse in the compaction chamber; and
forcing the refuse material through a funnel shaped opening in the compaction chamber by means of a larger ram

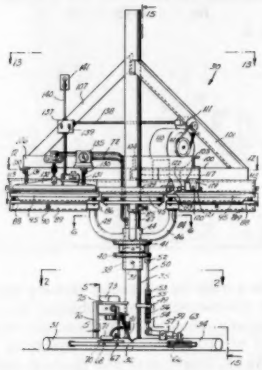
device driven by the small ram device through the compaction chamber.

3,854,398

SCREEN PRINTING AND DRYING MACHINE

Michael S. Martin, 1219 Fay Cir., Sacramento, Calif. 95831

Filed Nov. 3, 1972, Ser. No. 303,359
Int. Cl. B41f *15/12, 15/26*
U.S. Cl. 101—41 **1 Claim**



1. A turret type silk screen printing, drying and cooling machine for printing on articles such as garments, comprising a center post, a plurality of article support heads positioned in circumferentially equi-spaced relation about said center post, printing means on said post for printing against said support heads, means mounting said heads on said post for rotation thereabout, means for locking said last named means in a plurality of adjusted positions spaced 90° apart, means on said post providing heating means positioned at right angles from said printing means for heat drying an article positioned thereunder, air cooling means positioned at right angles from said heating means for cooling an article positioned therebeneath, means provided for permitting movement of said printing means from a position in contact with said article to a position spaced above said article, means on said machine operatively connected to said heating means for selectively moving said heating means into contact with said article and for selectively moving said heating means out of contact with said article, said support heads for said article including a heat resistant spring mounted tempered plate positioned in generally horizontal position, said plate being made of tempered glass so as to provide a smooth non-sticking surface, and a blower secured to said machine and operatively connected to said cooling means for supplying cooling air to said cooling means immediately after the article is printed thereon.

3,854,399

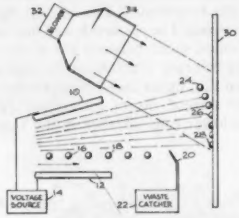
METHOD AND MEANS FOR OPERATING AN INK JET PRINTER WITHOUT SPLATTER

Robert I. Keur, Niles, and Henry A. Dahl, Mt. Prospect, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed Dec. 29, 1972, Ser. No. 319,909
Int. Cl. G01d *15/18*
U.S. Cl. 101—426 **6 Claims**

1. In an ink drop printer of the type wherein charged drops are projected by means through air, through a deflecting electric field toward paper, located beyond said deflecting electric field, to fall thereon at a location determined in accordance with the reaction between their charge and the electric field,

means for eliminating the effects of spatter caused by said drops impacting on said paper comprising:



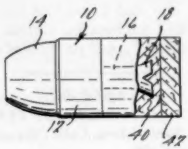
means for directing a flow of gas to intercept only the terminating portion of the path of said ink drops just prior to and at the time of impacting upon said region of said paper and to cover the region of said paper upon which said ink drops fall, for maintaining said drops intact.

3,854,400

CASELESS AMMUNITION AND PROPELLANT AND METHOD OF MAKING SAME

Jules E. Van Langenhoven, La Hulpe, Brussels, Belgium, assignor to Victor Comptometer Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 473,556, July 7, 1965, abandoned, Continuation-in-part of Ser. No. 189,621, April 23, 1962, abandoned. This application Dec. 19, 1968, Ser. No. 785,317
Int. Cl. F42b *5/18*
U.S. Cl. 102—38 **20 Claims**



1. A propellant charge for small arms ammunition consisting of a single grain having a porous structure, which is produced by mixing 100 to 150 parts by weight of a water soluble substance having a limited particle size in a range between 0.030mm and 0.25mm with 100 parts by weight of propellant composition, kneading the resulting composition with addition of solvent, forming the kneaded mixture into a desired shape to obtain a green grain, and immersing the thus obtained green grain in water for several days to elute out the water soluble substance homogeneously dispersed therein, drying the obtained grain, combining with the propellant charge a priming device at one end thereof and a bullet at the other end thereof to form a caseless cartridge.

3,854,401

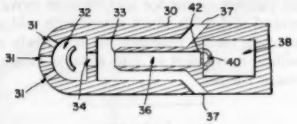
THERMAL IGNITION DEVICE

Evan D. Fisher, Chevy Chase, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 1, 1967, Ser. No. 687,397
Int. Cl. F42c *5/00*
U.S. Cl. 102—70 R **1 Claim**

1. A self ignition device for initiating thermal power supplies, comprising:

a. a hollow cylinder having an open end and a closed end forming a resonant cavity, said closed end being a membrane and said open end being adapted to receive ram air thereby generating a substantial amount of heat in said closed end;
b. a low ignition composition bonded to said membrane so that said low ignition material will be ignited by the heat generated in said closed end of said cavity;



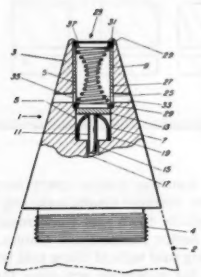
c. a thermal power supply placed in close proximity to the said closed end of said cavity so that thermal power supply will be initiated upon the ignition of said low ignition composition;
d. a pressure recovery chamber having inlet ports adapted to receive ram air; and
e. a nozzle connecting said pressure recovery chamber to said open end of said cavity.

3,854,402

PROJECTILE FUZE WITH FLEXIBLE BAFFLE

Stephan Kosonocky, Whippany, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 30, 1973, Ser. No. 383,646
Int. Cl. F42c *1/00*
U.S. Cl. 102—73 R **5 Claims**



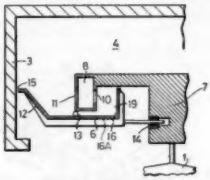
1. A fuze, for an explosive projectile, comprising:
a fuze body having a rear portion adapted to be attached to the front end of a projectile and a forward end adapted to impact a target, said forward end being formed with an enlongated axially-extending cavity open at the front end and having a stop intermediate the ends thereof:
a firing pin disposed within said body behind said stop and including a head slidable in said cavity; and
a flexible resilient discontinuous baffle mounted in said cavity, said baffle comprising a spiral coil spring extending between said stop and said open end and having close-spaced turns with a maximum spacing therebetween of about 4 mm., to form a barrier to discrete light objects, such as raindrops or foliage, having minimum dimensions greater than said maximum spacing, for dissipating the kinetic energy of said light objects and preventing said light objects from passing through said baffle and actuating said firing pin.

3,854,403

TRACKED AIR CUSHION VEHICLES

Denys Stanley Bliss, Cambridge, England, assignor to Bliss Pendair Limited, London, England

Filed July 2, 1973, Ser. No. 375,647
Claims priority, application Great Britain, July 3, 1972, 30954/72
Int. Cl. B61d *15/00*
U.S. Cl. 104—23 FS **23 Claims**



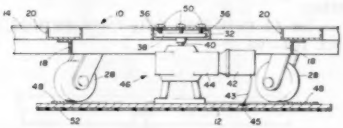
1. In a tracked air cushion vehicle assembly comprising a lift platform movable longitudinally of a channel section track with which it cooperates to define a chamber, said track channel having side walls, means for maintaining within said chamber an air cushion sustaining the weight of the vehicle, the lift platform supporting along opposite sides thereof edge seal members extending in the general plane of the lift platform towards the side walls of the track channel, and said edge seal members being capable of conforming to the profile of said side walls, the improvement wherein at least part of each edge seal member forms a barrier between the chamber and the external atmosphere, which barrier lies at an angle to the general plane of the platform whereby a resultant pressure force acts on each barrier tending to move the edge seal members towards each other, and wherein means are provided for applying an opposing force to said edge seal members whereby to balance said resultant forces when the pressure difference across each barrier is of predetermined magnitude.

3,854,404

TURNTABLE FOR HEAVY OBJECTS

Joseph F. Janda, 423 38th St. N.E., Cedar Rapids, Iowa 52402

Filed Feb. 18, 1972, Ser. No. 227,460
Int. Cl. B60s *13/02*
U.S. Cl. 104—44 **6 Claims**



1. A portable turntable for displaying a heavy object, said turntable comprising a supporting base engageable with the floor or other supporting surface for the turntable, a deck rotatable about a vertical axis and having a substantially flat upper surface suitable for carrying said object, a plurality of rollable anti-friction means affixed to the lower surface of said deck around the center thereof at locations equally distant from said axis, said anti-friction means being rollable on said base and transmitting the entire weight of said deck and the object carried thereby to said base, and drive means supported by said base and removably connected to said deck for controllably rotating said deck about said axis, said drive means including a motor, a vertical drive shaft driven by said motor, a drive plate connected to said shaft, and vertical drive pins

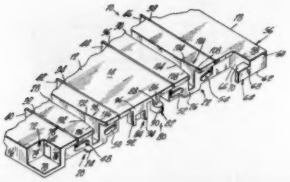
connecting said drive plate and said deck, said drive plate being vertically spaced from said deck so as not to receive any vertical force therefrom.

3,854,405

HIGH PERFORMANCE MODEL VEHICLE RACETRACK

Donald E. Martin, Smithtown, N.Y., assignor to Aurora Products Corp., West Hempstead, N.Y.

Filed June 8, 1973, Ser. No. 368,015
Int. Cl. A63g *1/00, 7/00, 21/00*
U.S. Cl. 104—60 **5 Claims**



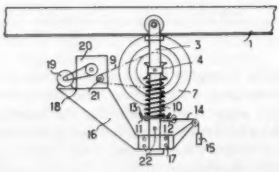
1. A track section for interconnection with like adjacent track sections for guiding a model vehicle, said track section comprising an elongated body having at least two ends and a running surface, at least one longitudinally extending guide means having at least two ends and being recessed within said track section for guiding a model vehicle with respect to said track section, means for removably interconnecting said track section with a like adjacent track section in a manner that the guide means of one of said like adjacent track sections substantially aligns with the guide means of the other said like adjacent track sections, lead-in means being located adjacent a track section end and also being located adjacent an end of said guide means, said lead-in means being constructed and arranged to at least partially align with a corresponding lead-in means of a like adjacent track section for smoothly guiding a model vehicle from the guide means of one of said like adjacent track sections to the guide means of the other of said like adjacent track sections notwithstanding misalignment of said respective guide means.

3,854,406

MOTORIZED SUSPENDED TROLLEY

Maxime Monne, 19 bis boulevard Delessert, 75 Paris, France

Filed Jan. 11, 1972, Ser. No. 217,069
Claims priority, application France, Jan. 13, 1971, 71.01562
Int. Cl. B61b *3/02;* **B61c** *13/04;* **E01b** *25/22*
U.S. Cl. 104—94 **10 Claims**



1. In a suspended transportation system having at least one flanged track portion, a trolley, which comprises:

a. roller means movable on a first side of said at least one flanged track portion;

b. drive wheel means selectively supported in resilient movable engagement with a second side of said at least one flanged track portion substantially opposite said roller means and operative to move therealong when rotated;

c. means for operatively supporting said drive wheel means in said resilient movable engagement with said second side including

i. column means connected to said roller means,

ii. slidable means mounted on said column means for slidable movement therealong and carrying said drive wheel means, and

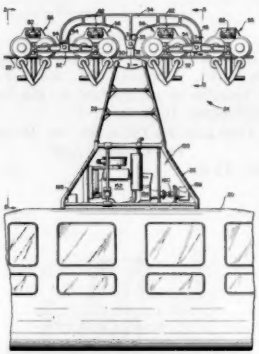
iii. resilient means for urging said slidable means along said column means for said resilient movable engagement of said drive wheel means with said second side, including means operative to selectively permit non-resilient movement of said slidable means along said column means.

3,854,407

AERIAL TRAMWAY VEHICLE DRIVE AND CONTROL SYSTEM

Kelly H. Cocroft, Mesa, Ariz., assignor to Skytram Systems, Inc., Scottsdale, Ariz.

Filed Apr. 4, 1973, Ser. No. 347,687
Int. Cl. B60b *17/02;* **B61b** *7/06;* **B61h** *7/12*
U.S. Cl. 104—112 **16 Claims**



1. An aerial tramway system comprising overhead track means, a vehicle, carriage means including wheel means suspending said vehicle from said track means, control means including fluid motor means drive connected to said wheel means for moving said vehicle along said track means, a fluid control circuit for supplying actuating fluid to said motor means, and pressure sensing means responsive to the pressure of the fluid discharged from said motor means to cause said motor means to automatically apply a fluid braking force to said wheel means when said discharge pressure reaches a predetermined value, thereby preventing runaway of said vehicle.

3,854,408

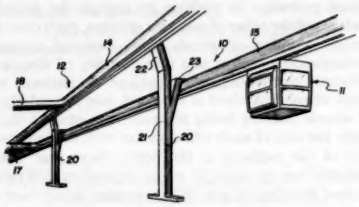
TRAFFIC NETWORK SYSTEM

Richard Montgomery Miller, 2700 Oakland Ave., Chula Vista, Calif. 75014

Filed Mar. 5, 1973, Ser. No. 337,904
Int. Cl. E01b *25/22*
U.S. Cl. 104—124 **5 Claims**

1. A vehicle transportation system having a plurality of vehicles of predetermined height and a continuous track layout adapted to accommodate said vehicles for movement therealong, said track layout having at least a first mainline track for movement of vehicular traffic in one direction, and

another mainline track for movement of vehicular traffic in another direction, said mainline tracks being separated by a relative elevation sufficient to permit vehicles moving among one track to pass across the other track without substantial gradient motion, said track layout being elevated above a supporting ground level and said vehicles being suspended



below said tracks, the difference in said relative elevation between said tracks being greater than the vertical height of any suspended vehicle, spaced apart stanchion members for supporting said track system, said stanchion members including a single pillar and a plurality of arms for supporting a corresponding plurality of tracks.

3,854,409

GUIDE SYSTEM FOR VEHICLE CARRIAGES

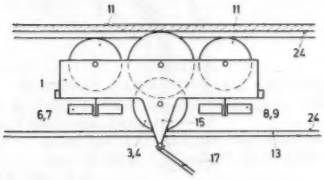
Ernst Blochlinger, Neuhausen, a.R., Switzerland, assignor to Schweizerische Industrie-Gesellschaft, Neuhausen a.R., Switzerland

Filed Apr. 7, 1972, Ser. No. 242,178

Claims priority, application Austria, Apr. 16, 1971, 3241/71; Nov. 10, 1971, 9692/71

Int. Cl. E01b *25/26*

U.S. Cl. 104—130 **23 Claims**



1. A system for guiding a travelling vehicle carriage through a switch comprising a rail in which said carriage rides, said rail having branch sections for leading said carriage in or from one or another direction, said carriage having roller means engaging the inner surfaces of said rail, single selector means mounted on said carriage independently of said roller means and disposed in the direction of travel of said carriage, tracking means fixed in said rail at least in the vicinity of said branch section adapted to engage said selector means, guide means adapted to engage said selector means fixed in each of said branches, and diverting means located between said tracking means and said guide means for engaging said selector means, said selector means and said diverting means being selectively movable relative to each other transversely to the direction of travel of said carriage to cooperatively cause said carriage to move laterally with respect to the corresponding branch section and to cause said selector means to engage said guide means located therein.

3,854,410

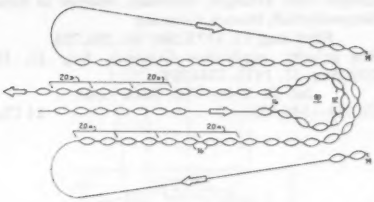
PNEUMATIC-ELECTRIC TRANSIT SYSTEMS

Wyly Kenneth Crowder, 3255 Windcroft Dr., Pontiac, Mich. 48054

Filed Apr. 5, 1972, Ser. No. 241,109

Int. Cl. B61b *13/00*

U.S. Cl. 104—147 R **13 Claims**



1. A drive system for vehicles comprising,

cylindrical guide means having a tubular opening therein,

drive means in said guide means movable within said opening,

said drive means including electric motor means powered by conductor means in said guide means,

said drive means including helical traction wheel means in said opening operable by said motor means to operate a vehicle exteriorly connected to said guide means and said drive means, and

pitch control means for said helical traction wheel means responsive to torque and thrust of said drive means for varying the pitch of said helical traction wheel means.

3,854,411

MECHANICALLY SETTABLE SWITCH FOR A MAGNETIC SUSPENSION RAILROAD

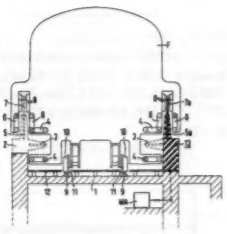
Alfred Lichtenberg, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 15, 1973, Ser. No. 388,562

Claims priority, application Germany, Aug. 25, 1972, 2241792

Int. Cl. B61b *13/08*; **B60m** *7/00*

U.S. Cl. 104—148 MS **5 Claims**



1. A mechanically settable switch for a magnetic suspension railroad in which guidance and support forces are generated by the interaction of primary conductor loops installed in the vehicle and secondary conductor means installed on the roadbed, and wherein propulsion is obtained through a linear motor which comprises stators in the vehicle which react with a reaction rail on the roadbed, comprising:

a a continuous non-magnetic conductor surface covering essentially the full switch area with which the primary conductor loops may react to support the vehicle while within the switch; and

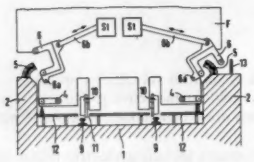
b a tongue movable between the straight portion and the curved portion of the switch, said movable tongue carry-

ing thereon secondary conductor means adapted to react with the primary conductor loops for guidance and a reaction rail for the linear motor.

3,854,412
SWITCH FOR USE IN A MAGNETIC SUSPENSION RAILROAD

Hans-Jurgen Dull, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 15, 1973, Ser. No. 388,755
Claims priority, application Germany, Aug. 25, 1972, 2241790; Aug. 25, 1972, 2241789
Int. Cl. B60m *7/00;* **B61b** *13/08*
U.S. Cl. 104—148 MS **11 Claims**



1. In a magnetic suspension railroad in which a vehicle is magnetically suspended and guided by the reaction of primary current carrying conductor loops in the vehicle with secondary conductor means installed on the roadbed, an improved switching arrangement for switching the vehicle between a straight track and a curved track comprising:

a. first secondary conductor means following a direction parallel to the direction of the straight portion of track;

b. second secondary conductor means following the path of the curved section of the track;

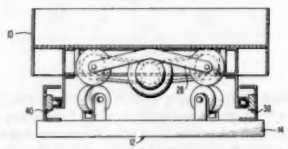
c. means comprising primary conductor loops installed in the vehicle arranged to react with said first and second secondary conductor means; and

d. means to selcetively provide for relative movement of said primary conductor loops with respect to said first and second secondary conductor means so that in the switch area only one secondary conductor plate is in the action range of said primary conductor loops.

3,854,413
TWIN TUBE CAR DRIVE

Joseph W. Broome, 430 S. 108th St., Franksville, Wis. 53126

Filed Sept. 13, 1973, Ser. No. 396,965
Int. Cl. B61b *13/00*
U.S. Cl. 104—166 **6 Claims**



1. A propulsion system for an individual car of a transportation system in which the cars are guided along predetermined pathways, said propulsion system comprising:

a. a pair of cylindrical tubes extending longitudinally of the car in parallel, spaced relationship to each other;

b. means mounted on said car for journalling said tubes for rotation about their axes;

c. a first plurality of wheels mounted in the predetermined pathways in position to engage the cylindrical surfaces of one of said pair of tubes, said first plurality of wheels being pivotably mounted in the predetermined pathways so that the angle the axis of each wheel makes with the longitudinal axis of the pathway at the point where that wheel is mounted can be varied;

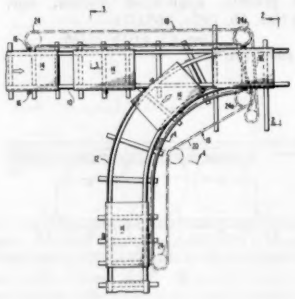
d. a second plurality of wheels mounted in the prededetermined pathways in position to engage the cylindrical surfaces of the other of said pair of tubes, each one of said second plurality of wheels being mounted opposite a corresponding one of said first plurality of wheels with reference to the longitudinal axis of the pathway at the point where that wheel is mounted, said second plurality of wheels likewise being pivotably mounted so that the angle the axis of each wheel makes with the longitudinal axis of the pathway at the point where that wheel is mounted can be varied; e. means journalling said first and second plurality of wheels for rotation about their axes; f. means operatively connecting corresponding wheels of said first and second plurality of wheels so that the absolute value of the angle the axis of each makes with the longitudinal axis of the pathway at the point where they are mounted is always equal, but the sense of the angle is opposite; and

g. power means operatively arranged to drive the system comprising said tubes and said reaction wheels.

3,854,414
POWER MERGE-SYNCHRONOUS

Bernard G. Bradbury, Chico, Calif., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Nov. 19, 1973, Ser. No. 417,322
Int. Cl. B61b *13/00*
U.S. Cl. 104—172 **45 Claims**



1. In a unit carrier system in which a plurality of cars are driven over a trackway having merges therein, a merge assisting device for interleaving on an outgoing track cars approaching a merge on a plurality of different incoming tracks without stopping said cars prior to the merge, said merge assisting device comprising:

a controlled-pathway, propelling device mounted adjacent to each of said incoming tracks;

at least one dog carried by each of said controlled-pathway, propelling devices and positioned to engage an incoming car on the adjacent one of said incoming tracks and to remain in engagement with said car until it has reached an exit speed at least equal to the speed of the fastest of said incoming cars times the number of said incoming tracks;

means for driving said controlled-pathway, propelling devices at said exit speed; and

means for synchronizing said controlled-pathway, propelling devices so that said cars reach said merge at intervals

at least slightly in excess of the length of the longest of said cars,

whereby said cars may be interleaved on said outgoing track without danger of collision with one another.

3,854,415

CONVEYING SYSTEM WITH WATER-WAY

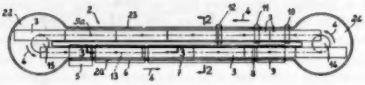
Paul Lamberet, Vonnas-Ain, France

Filed Jan. 12, 1973, Ser. No. 322,975

Claims priority, application France, July 21, 1972, 72.26993

Int. Cl. B61b *9/00*

U.S. Cl. 104—173 **5 Claims**



1. A conveying system for a production line, said system comprising means defining an endless water-way and including bottom and lateral inner walls, a plurality of floating carriages in said water-way, pulleys spaced along said water-way, a cable passing over said pulleys and along said water-way, and connecting means for attaching said carriages to said cable whereby the carriages are caused during operation of the conveying system to follow along said water-way, said carriages having bottom outer surfaces, said means for attaching said carriages pivotally to said cable being positioned substantially centrally on the bottom outer surfaces to avoid generation of pivotal torque during the operation of the conveying system and whereby said carriage can pivot freely as required, said carriages having side outer walls and including thereon rollers having vertical axes, said rollers being adapted to engage the lateral inner walls of said water-way for the guiding of said carriages; said connecting means including resilient means for accommodating expansion and contraction of said cable, said water-way including at least one rectilinear section and the carriages being connected to the cable such as to be in substantially abutting relation in said rectilinear section.

3,854,416

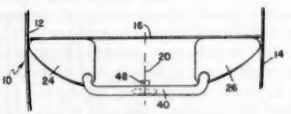
RAILWAY CAR FUEL TANK ASSEMBLY

Andre E. Pelabon, Paris, France, assignor to ANF Frangeco S.A., Courbevoie, France

Filed Apr. 13, 1973, Ser. No. 350,810

Int. Cl. B61c *5/02, 17/02;* **B61f** *1/08*

U.S. Cl. 105—1 A **6 Claims**



1. Liquid fuel storage system for a railway car, comprising a pair of similar elongated tanks extending horizontally along the length of a car and transversely spaced on opposite sides of the centerline thereof, conduit means disposed generally in the horizontal plane defined by the respective lowermost portions of said pair of tanks and in communication with the interiors of said tanks at said lowermost portions, and a single feed pipe for supplying fuel to an engine, one end of said feed pipe being in communication with said conduit means at a location midway of the respective ends of said tanks.

3,854,417

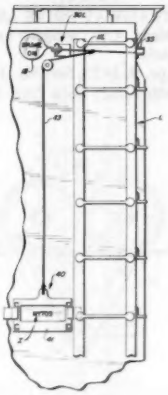
AUTOMATIC VISUAL HAND BRAKE SYSTEM

Robert W. MacDonnell, Crete, and Otto A. Shander, Chicago Heights, both of Ill., assignors to R. W. Mac Company, Crete, Ill.

Filed Mar. 13, 1974, Ser. No. 450,874

Int. Cl. B61d *49/00*

U.S. Cl. 105—1 A **8 Claims**



1. An automatic indicator system for a railway car having a truck mounted or conventional type B-end hand brake that has a hand wheel operable in a brake applying direction to take up a brake actuator chain and operable in a brake release direction to pay out the chain, said indicator system comprising an indicator flag, drive means for shifting the flag between an OFF position adjacent the car and an ON position projecting sideways beyond the car to be visible from anywhere alongside a train or track of cars, and actuator means connected under tension between said drive means and said chain and including a series connected take-up spring to accommodate differences in travel of said hand brake chain and said drive means in moving between ON and OFF positions.

3,854,418

IMPROVEMENTS IN RACK-AND-PINION SYSTEMS

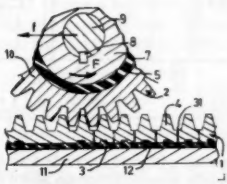
Jean Henri Bertin, Neuilly-sur-Seine, France, assignor to Bertin & Cie, Plaisir, France

Filed Mar. 1, 1973, Ser. No. 336,950

Claims priority, application France, Mar. 3, 1972, 72.07481; Sept. 21, 1972, 72.33405

Int. Cl. B61c *11/00*

U.S. Cl. 105—29 R **18 Claims**



1. A rack-and-pinion system including a rack and a toothed pinion in mutual meshing engagement, said rack comprising: a rigid longitudinal base having a proximal face with respect to the pinion; and

a resilient longitudinal element having:

a distal face with respect to the pinion, which distal face rests upon and is fixed to said proximal face of the said rigid longitudinal base, and

a proximal face with respect to the pinion, which proximal face is shaped into corrugations adapted to engage the teeth of the pinion.

3,854,419

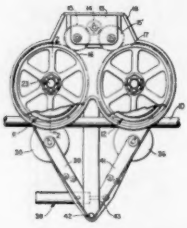
AERIAL TRAMWAY DRIVE ASSEMBLY

Kelly H. Cocroft, Mesa, Ariz., assignor to Skytram Systems, Inc., Scottsdale, Ariz.

Filed Apr. 9, 1973, Ser. No. 349,567

Int. Cl. B60b *17/02*; **B61b** *7/06*; **B61h** *7/12*

U.S. Cl. 105—153 **12 Claims**



1. An aerial tramway drive wheel comprising inner and outer wheel rim members detachably secured together for axial assembly and separation, axially inwardly projecting annular portions on said members, and similar oppositely inwardly inclined external peripheral tire mounting surfaces on said portions, each said surface being formed with circumferentially alternate axially extending projections and peripherally open recesses.

3,854,420

CROSS-COUPLING FOR THE TRUCKS OF A RAILROAD VEHICLE

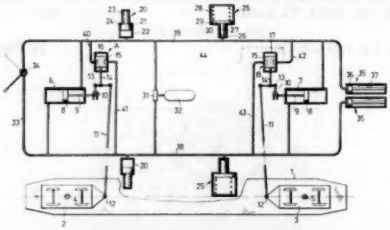
Hermann Hinnen, Sulz/Attikon, and Gaston Borgeaud, Winterthur, both of Switzerland, assignors to Schweizerische Lokomotiv-und Maschinenfabrik, Winterthur, Switzerland

Filed June 27, 1973, Ser. No. 373,913

Claims priority, application Switzerland, July 7, 1972, 10267/72

Int. Cl. B61d *1/00*

U.S. Cl. 105—176 **16 Claims**



1. In combination with a rail vehicle frame having at least two trucks pivotally mounted thereon about respective vertical axes, a cross-coupling including a pair of hydraulic cylinder means mounted on said vehicle frame, each said means being connected to a respective truck for pivoting said respective truck about a respective one of said vertical axes relative to said rail vehicle frame, and a pair of connecting conduits hydraulically connected between said cylinder means for synchronizing said cylinder means to pivot said trucks in opposite directions in response to pivoting of at least one of said trucks.

3,854,421

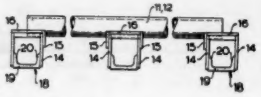
MINE CAR TRANSPORTATION SYSTEM

Hans Widiger, Neukollner Strasse 73a, Oberhausen-Sterkrade, and Dieter Hoffmann, Holthauserstr. 39, Hattingen, both of Germany

Division of Ser. No. 91,004, Nov. 19, 1970, Pat. No. 3,774,547. This application Jan. 22, 1973, Ser. No. 325,638

Int. Cl. B61b *9/00*; **B61d** *11/02*; **B61f** *5/00*

U.S. Cl. 105—275 **3 Claims**



1. In a transport system for underground mining comprising a car body having an elongate chassis, the chassis including a pair of laterally spaced longitudinally extending parallel arms and cross members connecting said arms, and further comprising at least two bogie means respectively adjacent each end of said chassis for supporting the respectively adjacent end of the chassis, the improvement wherein each bogie means comprises:

A. a platform,

B. a pair of horizontally aligned brackets mounted centrally on the upper side of said platform,

C. a bearing box secured to each bracket and receiving therein a portion of the adjacent parallel arm,

D. a plate situated beneath said platform,

E. means affixed to the platform and to the plate for supporting the platform above the plate and for enabling relative turning movement of the platform and plate about a vertical axis, and

F. track engaging wheel means mounted on said plate for engaging tracks and supporting the chassis during movement along the tracks.

3,854,422

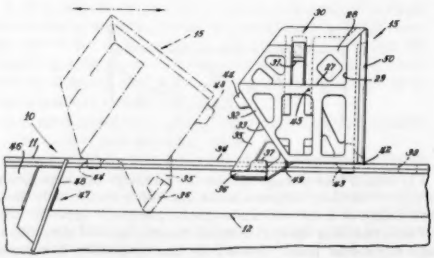
RETRACTABLE CONTAINER SUPPORT FOR RAILWAY FLAT CARS

Theodore J. Sweger, Lake Worth, Fla., assignor to Illinois Railway Equipment Company, Chicago, Ill.

Continuation-in-part of Ser. No. 276,692, July 31, 1972, abandoned. This application Aug. 20, 1973, Ser. No. 390,015

Int. Cl. B65j *1/22*; **B60p** *7/10*

U.S. Cl. 105—366 D **7 Claims**



1. A railway flat car comprising a deck having a longitudinal slot with windows in spaced relation along one side, a container support slidable along said slot having a generally horizontal seat to support an associated lower corner of a con-

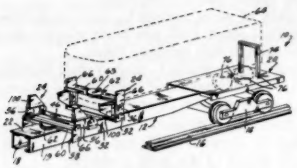
tainer, said container support having a pair of connected walls arranged in right angular relation and extending upwardly from said seat to restrain said container against horizontal movement, one of said connected walls adapted to overlie said vertical side wall of said container, a strut extending from a side of said container support through said slot, a wing at the distal end of said strut underlying said deck and said windows, shear lug means depending from said container support and adapted to extend into one of said windows for restraining said container support against horizontal movement, and said side of said container support from which said strut extends having a sliding surface for sliding engagement with said deck when said container support is pivoted to withdraw said shear lug means from said one window to permit movement of said container support along said slot, the center of gravity of said container support being longitudinally spaced on one side of said shear lug means when said container support is in the operative position and being longitudinally spaced from said shear lug means in the opposite direction when said container support is pivoted to the sliding position whereby no upward force is required to be applied to said container support during such movement.

3,854,423

RAIL CAR TRAILER HITCH AND CONTAINER MOUNT

John Bridge, 65 W. Jackson, Chicago, Ill. 60604

Filed Dec. 6, 1972, Ser. No. 312,660
Int. Cl. B65j 1/24; B60p 7/08
U.S. Cl. 105—368 B **12 Claims**



1. A combination trailer hitch and container mount, carried on a railway flatcar comprising:

a collapsible stanchion means having a hitch means arranged to secure and support the kingpin of a vehicular highway trailer carried on the flatcar when said collapsible stanchion is in an upright, non-collapsed position and having a container mount means arranged to retain and support a cargo container carried on the flatcar when said collapsible stanchion is in a lowered, collapsed position, said collapsible stanchion means being mounted on said railway flatcar and having a cushioning means for limited yieldable movement along a longitudinal plane and being substantially restricted in a lateral plane,

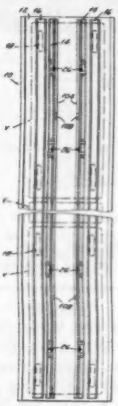
said hitch means comprised of a laterally extending hitch frame having a retainer plate secured to each of opposite ends thereof and arranged to laterally retain said highway trailer, and said container mount means comprises a laterally extending base plate having a support leg connected at each end thereof, arranged to laterally retain said cargo container.

3,854,424

TIE-DOWN AND LOCKING SYSTEM

Donald J. Blunden, Southfield, and Israel D. Peisner, Huntington Woods, both of Mich., assignors to Whitehead & Kales Company, River Rouge, Mich.

Continuation-in-part of Ser. No. 342,385, March 19, 1973,. This application May 16, 1973, Ser. No. 360,766
Int. Cl. B60p 7/08
U.S. Cl. 105—368 T **16 Claims**



1. Apparatus for securing a vehicle on the elongated deck of a transport, comprising guide means including a rail secured upon and extending lengthwise of the deck, a carriage mounted on said rail for movement lengthwise thereof, means for securing said carriage against movement with respect to said rail, means for connecting said carriage to the underframe of the vehicle comprising a rear flexible link chain extending from the rear portion of said carriage, a front flexible link chain extending from the front portion of said carriage, a connecting member joined to the ends of said link chains and adapted to be connected to the underframe of the vehicle so that said rear link chain extends downwardly and rearwardly therefrom to said carriage to restrain the vehicle from forward movement and said front link chain extends downwardly and forwardly therefrom to said carriage to restrain the vehicle from rearward movement, means on said carriage engageable with any link of each chain depending on the distance between said carriage and the underframe of the vehicle to hold said chain in tension, said last-mentioned means comprising an anchor member having a slot of a width greater than the thickness but less than the width of the links of said chains and open at one end to receive a link inserted edgewise therein, and a tension member for each chain engaging the same between said connecting member and said anchor member.

3,854,425

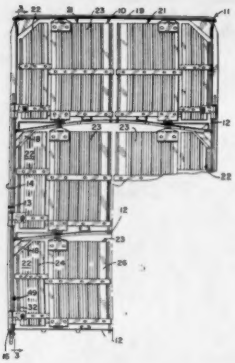
END DOORS FOR AUTO RACK CARS

John W. Allen, Flossmoor, Ill., assignor to Stanray Corporation, Chicago, Ill.

Filed July 9, 1973, Ser. No. 377,407
Int. Cl. B65j 1/22
U.S. Cl. 105—368 R **7 Claims**

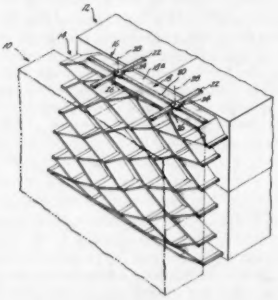
1. An end wall for an automobile carrying multi-deck railway car said end wall comprising an inboard section and an outboard section means pivotally connecting said inboard and outboard sections for swinging movement relative to each

other about a vertical axis and means connecting said inboard section to said decks for swinging movement about an axis



spaced inwardly of the end of the car between a position across the end of the car and a position along the inside wall.

3,854,426
LOCKING MEANS FOR SUSPENSION MEMBER IN SUSPENDIBLE LOAD SPACER
William P. Kinnune, Jr., Portland, Oreg., assignor to Western-Kraft Corporation, Portland, Oreg.
Filed May 4, 1973, Ser. No. 357,358
Int. Cl. B61d *45/00*
U.S. Cl. 105—486 **7 Claims**



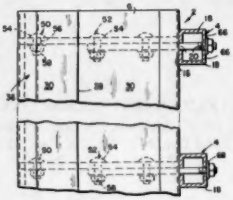
1. In a load spacer for holding apart a pair of adjacent laterally spaced loads, where the spacer includes a spacing structure which is removably placeable between such loads, and an elongated suspension member pivoted intermediate its ends to the top of the spacing structure for swinging about a generally upright axis between a stored position where its extremities are disposed inwardly of the opposite sides of the spacing structure, and a suspending position where such extremities extend laterally beyond said opposite sides, whereby such extremities may rest on the tops of such loads thus to suspend the spacing structure between the loads, the improvement comprising

means for automatically and releasably locking said suspension member in said suspending position with swinging of the member to such position from said stored position, said means including

a resilient latch mounted on said suspension member for swinging therewith, capable of elastic bending away from the suspension member in a direction substantially normal to the plane in which the member can swing, and

a catch fastened to the top of said spacing structure adjacent said suspension member, operable releasably to catch said latch with movement of said suspension member to said suspending position, thus releasably to lock the suspension member in said suspending position, movement of said suspension member toward its said suspending position causing engagement of said latch and catch, with resultant bending and climbing of the former over the latter to become caught by the latter.

3,854,427
ADJUSTABLE SUPPORT SHELF
Williams M. Corns, Baywood Ave., Ross, Calif. 94957
Filed Jan. 26, 1973, Ser. No. 326,915
Int. Cl. A47f *5/12*
U.S. Cl. 108—1 **4 Claims**



1. In an adjustable shelf having upright supports and horizontally extending shelves the relative position of which is adjustable for accommodating objects of varying sizes and weights, the improvement comprising:

a. a plurality of posts defined by pairs of members aligned in a vertical plane, each pair being spaced apart to define narrow upright slits between them;

b. a plurality of generally L-shaped shelf members defined by a one-piece sheet metal piece having an uninterrupted surface and a plurality of at least three parallel, longitudinally extending substantially perpendicular bends defining laterally terminating U-shaped end sections extending over the length of the shelf members;

c. a plurality of L-shaped brackets having first and second perpendicular legs free ends of which being disposed within the U-shaped end sections for slideable movement of the brackets over the length of the shelf members, the brackets having a pair of slots extending from the free ends to adjacent opposite ends of the bracket legs, the bracket legs, the spacing of the brackets on the shelf members corresponding to the spacing of the slits between the upright member pairs;

d. a pair of horizontally extending eye bolts for each bracket disposed in the slits;

e. first bolt means for each eye bolt extending through an eyelet thereof and through one of the slots;

f. second bolt means extending through the other one of the slots;

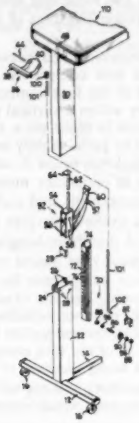
g. the first and second bolt means including shaft sections larger than the width of the slots;

h. means for tightening the first and second bolt means to thereby engage the shaft sections thereof with the adjacent legs of the brackets, firmly secure the eye bolts to the brackets, spread the free ends of the bracket legs and to thus secure the brackets to the shelf members;

i. means for tightening the eye bolts to thereby draw the shelf members towards the upright members until the shelf members contact the upright members and the eye bolts, the shelf members and the upright members firmly engage each other and form a rigid structure;

whereby the number of posts and shelf members and their relative positions are readily and infinitely adjustable and variable over their respective extent for adaopting the shelf for use with articles of varying size and weight.

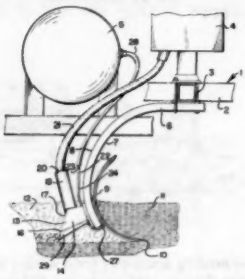
3,854,428
OVERBED TABLE
Eugene Henry Fullenkamp, Batesville, Ind., assignor to Hill Rom Company, Inc., Batesville, Ind.
Filed May 14, 1973, Ser. No. 359,980
Int. Cl. A47b *9/00*
U.S. Cl. 108—146 **10 Claims**



1. In a hospital table having a base vertically supporting a first member with a second member telescopically mounted thereon and having a table cantilevered from said second member, the improvement comprising:
   a. Surface means having spaced notches vertically carried by one of said members;
   b. A detent mechanism carried by said other member and having a pawl means engageable with said notches for normally precluding downward telescopic movement of said second member and friction means continuously engaging said pawl means and said surface means for automatically disengaging the pawl means upon upward telescopic movement of said second member;
   c. Mechanical unlatch means carried by the other member and attached to said pawl means for manually unlatching said detent mechanism for downward telescopic movement of second member.

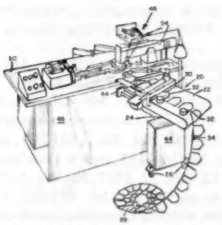
3,854,429
FERTILIZER DISPENSER
Calvin B. Blair, P.O. Box 76, Barnard, Kans. 67418
Filed Jan. 19, 1973, Ser. No. 325,175
Int. Cl. A01c *23/02*
U.S. Cl. 111—7 **5 Claims**

1. A fertilizing implement comprising:
   a. an agricultural tool plow tooth support having a forward surface and a trailing surface,
   b. a plow tooth mounted on said forward surface and having a point adapted to project into the soil and open a furrow upon the forward motion of said support,
   c. a rearwardly open dispenser box mounted on said trailing surface and having spaced apart upwardly extending side walls and a bottom wall,
   d. a dry material dispensing tube secured to said box and having a lower end opening above said bottom wall, dry material supply means communicating with said dispensing tube, an anhydrous ammonia tube extending downwardly past said box and having a lower end terminating behind said plow tooth, anhydrous ammonia supply means communicating with said ammonia tube,



   e. said bottom wall sloping downwardly and rearwardly from said support and serving to close the portion of the furrow into which ammonia is dispensed while dry material is directed rearwardly from said box, and
   f. wings directed laterally outwardly of said side walls near said bottom wall and adapted to cooperate with said bottom wall in closing said furrow portion.

3,854,430
MATERIAL HANDLING APPARATUS AND METHOD
Carney J. Bryan, Greensboro, N.C., assignor to Blue Bell, Inc., Greensboro, N.C.
Continuation of Ser. No. 675,947, Oct. 17, 1967, abandoned.
This application May 22, 1972, Ser. No. 255,910
Int. Cl. D05b *19/00*
U.S. Cl. 112—121.11 **25 Claims**



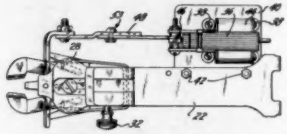
1. A method of handling a supply of connected material segments, the segments having a common edge sewn by and suspended from connecting elements such that the segments are sequentially positioned in spaced relation along the connecting elements, comprising the steps of: feeding the connected segments sequentially along a directed path of travel, orienting and aligning the connected segments in a prescribed manner as they are moved along a directed path of travel by engaging the connecting elements and the common sewn edges of the segments; separating the connected and aligned segments as they are moved along a directed path of travel by severing the connecting elements intermediate adjacent segments; feeding the separated segments sequentially proximate sewing instrumentalities; simultaneously forming a plurality of parallel stitch lines on a segment with at least one abrupt change in direction of the stitch lines to achieve a preselected, irregular sewn pattern; reconnecting the separated segments with parallel stitch lines; and discharging the connected segments in a connected fashion.

3,854,431

OPENING MEANS FOR BUTTON-HOLDING ACCESSORY TO SEWING MACHINE

Massimo A. Chierico, Lyndhurst, N.J., assignor to A-1 Sewing Center, Lyndhurst, N.J.

Filed June 19, 1973, Ser. No. 371,551
Int. Cl. D05b *3/00*
U.S. Cl. 112—114 **1 Claim**



1. A button-holding accessory for a sewing machine including an opening device, said accessory having two inwardly, angularly, spring-biased button-holding jaws, wherein said accessory comprises:

a. a base upon which said jaws are pivotally mounted; and

b. means for opposing the spring-bias of said jaws, said opposing means comprising:

i. a solenoid mounted upon said base,

ii. a cross-bar disposed in abutting relationship to said button-holding jaws, and

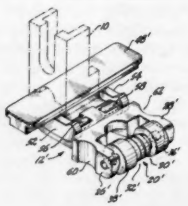
iii. a connecting link comprised of two longitudinally adjustable bars, one of said bars being mounted to said solenoid, and the other of said bars being mounted upon said cross-bar which urges said two button-holding jaws apart against the spring-bias of said jaws to effect a required opening in order to seat and hold a button therein in abuttingly opposed relationship to said spring-biased jaws, thereby assisting the operator of a sewing machine in the opening of said jaws.

3,854,432

PRESSER FOOT ATTACHMENTS

Robert B. Howell, 3400 W. Mercer Way, Mercer Island, Wash. 98040

Continuation-in-part of Ser. Nos. 125,203, March 17, 1971, abandoned, and Ser. No. 764,518, Oct. 2, 1968, , said Ser. No. 125,203, is a division of Ser. No. 869,836, Oct. 27, 1969, Pat. No. 3,618,547, which is a continuation-in-part of Ser. No. 764,453, Oct. 2, 1968, Pat. No. 3,511,201, said Ser. No. 764,518, and Ser. No. 764,453, each is a continuation-in-part of Ser. No. 678,742, Oct. 27, 1967, Pat. No. 3,473,498, which is a continuation-in-part of Ser. No. 501,066, Oct. 22, 1965, Pat. No. 3,349,736, which is a continuation-in-part of Ser. No. 475,486, July 28, 1965, Pat. No. 3,342,151. This application Aug. 14, 1972, Ser. No. 280,473
Int. Cl. D05b *29/10*
U.S. Cl. 112—235 **10 Claims**



1. For use with a sewing machine equipped with a reciprocating needle, a material advancing mechanism, and a presser bar located generally above said material advancing mechanism, a presser foot assembly comprising:

a foot component including downwardly directed presser surface means; a transverse slide member located above said foot component having a substantially constant cross-sectional configuration throughout its length;

mounting shank means removably connectible to said presser bar, and including means for frictionally engaging said transverse slide member, but permitting longitudinal travel of the transverse slide member in response to a force of sufficient magnitude to overcome the friction force, said means for frictionally engaging said slide member comprising means forming a transverse slideway at the lower end of the mounting shank having a cross-sectional configuration like that of the transverse slide member;

connector means interconnected between said transverse member and said foot component, permitting limited pivotal movement of the foot component relative to the transverse member within a vertical plane, so that when the foot assembly is in place on a presser bar the foot component is free to pitch slightly in response to variations in material thickness below it, said connector means comprising a pair of connector members, one on each side of said foot component, and each having a first end portion connected to the transverse member and a second portion spaced therefrom longitudinally of the foot component, and pivot joint means securing said second portion to said foot component for pivotal movement about an axis extending laterally of said foot component, each said connector member including a transverse pivot shaft received in a transverse socket formed in an upper intermediate portion of the foot component; and

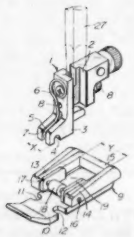
said foot component being recessed at its sides to receive said connector members and including side boundaries forwardly of the recesses which serve as guide surfaces.

3,854,433

ZIPPER FOOT FOR USE WITH SEWING MACHINE

Susumu Hanyu, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed May 2, 1973, Ser. No. 355,849
Claims priority, application Japan, May 4, 1972, 47-51511
Int. Cl. D05b *29/00*
U.S. Cl. 112—235 **2 Claims**



1. A zipper foot for use with sewing machines having a needle for sewing of material that is being fed in a longitudinal direction, and a supporting member provided with a zipper-foot retaining spring, said zipper foot comprising a base plate having a top face and a bottom face for contacting the material, a pair of opposite longitudinal edges extending in said direction and formed with respective inwardly extending needle recesses, and a pair of upstanding walls each projecting upwardly from said top face and being transversely spaced by a first width; a mounting pin extending transversely of said longitudinal edges from one to the other of said upstanding walls; and adjusting means axially shiftable on said mounting pin and having in axial direction of the same a second width

smaller than said first width so that an axially extending portion of said mounting pin is always exposed for engagement with said supporting member and said retaining spring, said adjusting means being axially shiftable on said mounting pin between two first positions in each of which an imaginary line passing through said needle in said longitudinal direction intersects one of said needle recesses inwardly of the respectively associated edge, and two second positions in each of which said imaginary line coincides with one of said longitudinal edges.

3,854,434

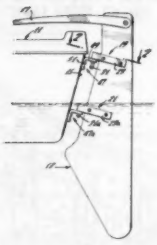
LOCK PINTLE FOR A RUDDER

Kurt J. Pfahl, 3077 Hayes Ave., Costa Mesa, Calif. 92626

Filed June 29, 1973, Ser. No. 374,882

Int. Cl. B63h *25/00*

U.S. Cl. 114—172 **10 Claims**



1. A lock pintle for attaching a rudder to a mounting member of a boat wherein the mounting member has an aperture therein, said lock pintle comprising:

a bracket attachable to the rudder;

a pintle;

means for attaching the pintle to the bracket with a portion of the pintle projecting away from the bracket, said portion of said pintle being receivable in the aperture of the mounting member to at least assist in mounting the rudder for pivotal movement relative to the boat;

a locking element attached to the pintle and movable generally radially thereof between a locking position in which the locking element locks said portion of the pintle against removal from the aperture of the mounting member and a releasing position in which the locking element allows said portion of the pintle to be withdrawn from the aperture of the mounting member, said locking position being radially outwardly of said releasing position; and

means for resiliently urging said locking element radially outwardly toward said locking position.

3,854,435

INSTALLATION FOR ASSEMBLYING SHIP HULL SUBASSEMBLIES

Yoshitaka Kinoshita, Yokosuka, Japan, assignor to Sumitomo Shipbuilding & Machinery Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1973, Ser. No. 419,945

Claims priority, application Japan, Jan. 18, 1973, 48-8336; Feb. 28, 1973, 48-23885

Int. Cl. B63b *3/00*

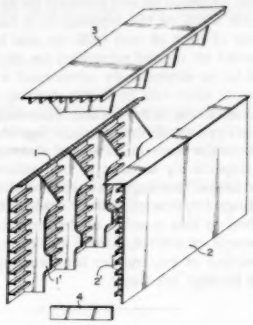
U.S. Cl. 114—65 R **5 Claims**

1. An installation for assemblying ship hull subassemblies each consisting of a pair of vertical subblocks which are to be assembled in parallel with each other in the longitudinal direction and in transversely spaced apart relation and a horizontal subblock to be joined to the upper or lower side edges of said pair of vertical subblocks, said installation comprising

a. a parallelepiped structure whose ceiling and at least one side are opened,

b. means for separately carrying said subblocks into said structure,

c. means for positioning said subblocks in said structure, said positioning means comprising stopper means which is disposed adjacent to one end wall of said structure for abutting against one vertical end of said subblock, and means for pushing said subblock in the longitudinal direction so as to abut said subblock against said stopper means,



d. means for releasably engaging with the vertical ends of said vertical subblocks, thereby holding said vertical subblock in vertical position,

e. scaffold carriage means which is provided with a plurality of vertically movable scaffolds and which is adapted to travel in the horizontal direction in a lower or upper portion, and

f. a carriage adapted to travel upon the floor of said structure, to carry an assembled subassembly thereupon and to move said subassembly out of said structure through said opened side thereof.

3,854,436

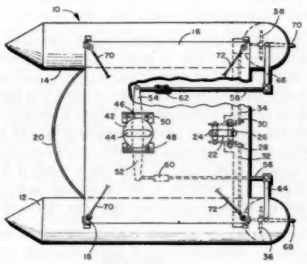
MOTORCYCLE BOAT

Oscar Leon Cox, 3856 Castleman, Riverside, Calif. 92503

Filed Oct. 23, 1973, Ser. No. 408,544

Int. Cl. B63h *25/00*

U.S. Cl. 115—.5 A **3 Claims**



1. A catamaran boat for use in combination with an engine-driven motorcycle which has a single ground-engaging drive wheel rotated by engine power and which has a single ground-engaging wheel movable on a substantially vertical axis for steering of the motorcycle, said boat comprising:

two spaced catamaran hulls and a deck attached to said hulls for providing buoyancy and stability to said boat and to the motorcycle mounted on said boat and to an operator of the motorcycle;

a power roller and another roller mounted on said platform for engagement by the ground-engaging wheel of the motorcycle, first and second propellers mounted for rotation on axes extending generally longitudinally of said boat, one of said propellers being associated with each one of said hulls at the aft end thereof and positioned so that a substantial portion of said propellers is submerged when said boat is floating, drive means interconnecting said power roller and said propellers for rotating said propellers when said power roller is rotated;

a turntable mounted on said platform for engagement by the steerable wheel on the motorcycle, a rudder mounted at the rear of each of said hulls on said boat respectively positioned aft of said propellers on said hulls and positioned to be substantially submerged when said boat is floating to steer said boat, the steering yoke secured to each side of said turntable and extending laterally therefrom in opposite directions, steering rods pivotally connected to the outer ends of said steering yoke, steering arms respectively secured to said udders and being attached to said steering rods so that rotation of said turntable causes rotation of both of said rudders in the same direction so that steering of the steerable wheel on the motorcycle causes rotation of said turntable and change in direction of said rudder for directing said boat as it moves through the water.

3,854,437

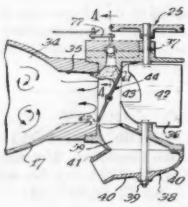
HYDRAULIC JET STERN STEERING CONTROL

Thomas A. Stansbury, 7237 S. Shore Dr., Chicago, Ill. 60649

Filed May 12, 1972, Ser. No. 252,901

Int. Cl. B63h *11/10*

U.S. Cl. 115—12 R **17 Claims**



1. A directional control means for a hydraulic jet turbine having a Venturi section, a main propulsion opening in said Venturi section, a main shutoff valve closing said main propulsion opening, said valve being able to close the Venturi nozzle to stop flow of water through the Venturi section wherein the improvement comprises another opening in said Venturi section contiguous to said main shutoff valve to evacuate material forming against said main shutoff valve when it is closed and said hydraulic jet turbine is in operation and a secondary shutoff valve means closing said another opening.

3,854,438

ACCIDENT PREVENTION DEVICE

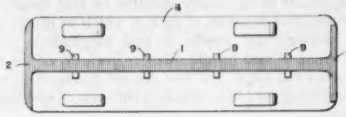
Jose J. Soto, 3041 Edwin Ave., Fort Lee, N.J. 07024

Filed Mar. 29, 1973, Ser. No. 346,117

Int. Cl. B60q

U.S. Cl. 116—28 R **5 Claims**

1. In combination with a vehicle, an accident prevention device comprising a longitudinally extending light conducting material having a front end portion fitted on the outside front of said vehicle and a rear end portion fitted on the outside rear of said vehicle, said front end portion having a contoured surface for collecting impinging light originating from a forward vehicle and transmitting said light through the length of said light conducting material, and said rear end portion having a contoured surface for transmitting light collected at said front end portion to a following vehicle.



3,854,439

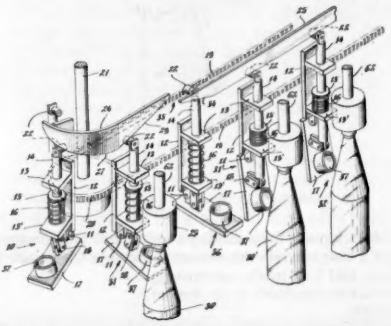
BOTTLE SPRAYING APPARATUS

Joseph T. Harmuth, Greenwich, Conn., assignor to Indian Head Inc., New York, N.Y.

Filed June 21, 1973, Ser. No. 372,161

Int. Cl. B05c *5/00*

U.S. Cl. 118—4 **8 Claims**



1. In a continuous production line system for spraying articles supported by a plurality of moving chuck conveyors, protective means for automatically covering empty chucks comprising in combination, a first conveyor line carrying a plurality of uniformly spaced chucks at predetermined intervals, means for moving said first line at a constant rate of traverse, a second conveyor line extending a selected distance parallel and adjacent to said first line, means for moving said second line in synchronism with said first line, a plurality of hinged cover members mounted on said second conveyor line at uniformly spaced intervals corresponding to said predetermined chuck intervals, each of said hinged cover members adjacent one of said chuck members through out said selected distance, and cam operated means connected to each of said hinged cover members for controlling movement of said hinged members into protective covering engagement with an adjacent empty chuck.

3,854,440

SLIDE STAINING APPARATUS

Thomas W. Astle, 607 Harbor View Rd., Orange, Conn. 06477

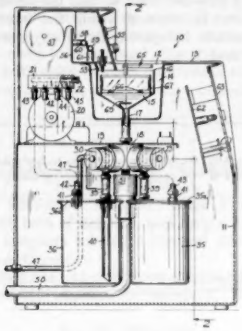
Filed Apr. 24, 1972, Ser. No. 246,720

Int. Cl. B05c *11/00*

U.S. Cl. 118—7 **11 Claims**

1. Apparatus for staining slides comprising a staining chamber adapted to receive slides therein, said chamber having an open top and a lower passage communicating with a manifold, a plurality of receptacles adapted to contain reagents, valving means connecting each of said receptacles to said manifold, means for operating said valves to selectively allow a reagent from a receptacle to be delivered to said chamber and returned to its receptacle, a second chamber surrounding said staining chamber and adapted to catch any overflow there-

from, additional inlet valve means and outlet valve means, said inlet valve means adapted to connect said manifold to a fresh



water tap supply, said outlet valve means connecting staining chamber to a drain, and conduit means connecting said second chamber to said drain.

3,854,441

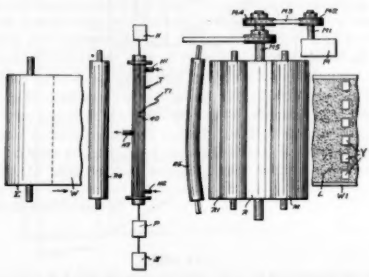
APPARATUS FOR APPLYING BARRIER COATING SUBSTANCES TO SHEET MATERIALS

George C. Park, North Reading, Mass., assignor to Bolton-Emerson, Inc., Lawrence, Mass.

Continuation-in-part of Ser. No. 259,072, June 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 48,660, May 15, 1970, abandoned, Division of Ser. No. 806,473, March 12, 1969, Pat. No. 3,556,832, which is a continuation-in-part of Ser. No. 806,040, March 6, 1969, abandoned, which is a continuation of Ser. No. 335,67, Jan. 3, 1964, abandoned. This application Feb. 22, 1973, Ser. No. 334,747

Int. Cl. B05c *5/02*

U.S. Cl. 118—34 **1 Claim**



1. Apparatus for applying a viscous coating of the hot melt class to a web of material, said apparatus comprising a frame, a supply roll member for supporting a wound roll of the material at one end of the frame, winding roll means mounted at an opposite end of the frame, power driving mechanism for actuating the winding roll and drawing off a web of the material at a desired rate of travel, a coating tube arranged in the frame below the path of said web to engage the web, said coating tube being constructed with a curved upper side and having an elongated discharge aperture formed along said upper side and lying within the confines thereof, said aperture having high lead-on edge and a low lead-off edge, tension roll means located both in advance of, and in rear of, said tube on said path for exerting tension in the web and guiding the web in an arcuate path of travel over said curved upper side and over said lead on and lead-off edges, a roll mount structure, a press roll rotatably supported in the roll mount structure above the coating tube in rolling engagement with the web and forming a pressure nip with said tube, and said press roll having its axis of rotation in rear of said lead on edge directly above said lead-off edge and lying in a vertical plane which passes through the lead-off edge of the elongated discharge aperture.

3,854,442

VAPOR-DEPOSITION APPARATUS

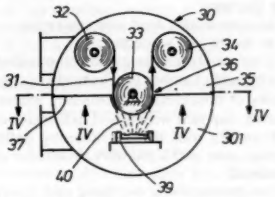
Helmut Adam; Alfred Ortlieb, and Eberhard Traub, all of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 18, 1972, Ser. No. 272,967

Claims priority, application Germany, Aug. 20, 1971, 2141723

Int. Cl. C23c *13/08*

U.S. Cl. 118—49 **6 Claims**

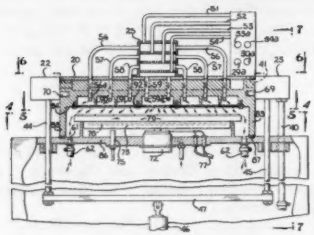


1. A vapor-deposition arrangement, comprising, in combination, housing means defining a vaporization compartment and an additional compartment communicating with said vaporization compartment via a communication opening; moving means for moving a web to be coated across said communication opening along a predetermined path so oriented with respect to said communication opening that a web moved by said moving means across said opening and along said path blocks said opening and separates said compartments from each other; evacuating means for establishing subatmospheric pressure in said compartments; and vaporizing means within said vaporization compartment for creating a stream of vaporized material directed towards said communication opening for condensation upon the one side of the web facing said vaporization compartment, whereby any volatile substance which, due to the liberated heat of said condensation, escapes from the web at other side thereof and into said additional compartment will substantially be prevented by the presence of the web from passing into said vaporization compartment through said communication opening, and wherein said moving means includes a generally cylindrical guide roller interposed between said compartments substantially closing said opening and adapted to guide and support a ribbon-like web at the side of the latter facing said additional compartment, and wherein the outermost peripheral surface of said guide roller is incomplete so that a web supported on said outermost peripheral surface will be engaged by said roller only at portions of its surface so as to permit passage into said additional compartment of volatile substances escaping from the unsupported portions of said other side of such web.

3,854,443
GAS REACTOR FOR DEPOSITING THIN FILMS

William Baerg, Palo Alto, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 19, 1973, Ser. No. 426,307
Int. Cl. C23c *13/08*
U.S. Cl. 118—49 **5 Claims**



1. In a reactor for vapor depositing, comprising:

a bell member and a horizontally disposed platform defining a reaction chamber;

a horizontally disposed rotatable susceptor supported on said platform and adapted to support at least one substrate thereon;

means to controllably heat said susceptor;

means to rotate said susceptor;

means to relatively translate said bell member and platform whereby said chamber is selectively opened or sealed;

a plurality of concentric, horizontally spaced annular wall elements disposed within said bell member and depending from the roof thereof whereby defining a central chamber zone and a plurality of annular chamber zones thereabout;

said zones coextensively overlying said susceptor;

a diffuser screen extending across the open ends of each said chamber zone;

a plurality of reactor exhaust means disposed at the periphery of said platform;

a plurality of inlet ports in each of said zones for feeding the gas of said deposition vapor and whereby said gas is uniformly dispensed through said diffuser screen, radially swept across the at least one substrate to effect said deposition and passed through said exhaust means.

3,854,444
APPARATUS FOR MANUFACTURING WATERPROOF CABLE

Edward L. Franke, Jr., Perry Hall, and William J. Hyde, Baltimore, both of Md., assignors to Western Electric Company, Incorporated, New York, N.Y.

Division of Ser. No. 155,055, June 21, 1971, Pat. No. 3,767,456. This application June 13, 1973, Ser. No. 369,652
Int. Cl. C23c *13/10*
U.S. Cl. 118—50 **8 Claims**

1. Apparatus for applying a compound to a stranded article, which comprises:

means for evacuating air from interstices of successive portions of the stranded article;

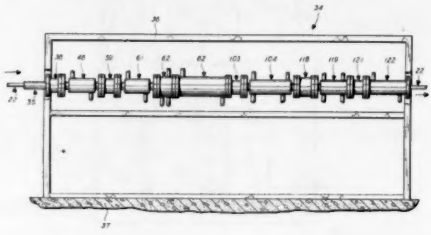
a compound-applying section;

means for moving the air-evacuated successive portions of the stranded article through the compound-applying section;

means for moving amounts of the compound in a semifluid state into the compound-applying section and into contact with the successive portions of the stranded article to facilitate the drawing of portions of the semifluid compound into the air-evacuated interstices of the successivee portions of the stranded article;

a compound-conditioning section whereat the compound is placed in a jelly-like state,

means for moving the compound-filled stranded article through the compound-conditioning section whereat the semifluid compound is conditioned to place the compound in a jelly-like state so that the compound is nonflowable and is retained within the interstices of the stranded article independently of any other supporting structure, and

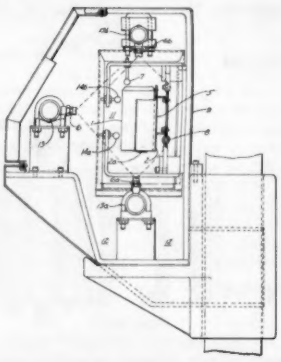


means for cooling the air-evacuated successive portions of the stranded article after the portions have been moved through the means for evacuating air and prior to the entry of the portions into the compound-applying section to place in a jelly-like state any portions of the compound which are drawn from the compound-applying section toward the means for evacuating air to preclude entry of the compound into the means for evacuating air.

3,854,445
CAN TREATING APPARATUS

Ralph J. Stolle, Lebanon; Richard J. Hasselbeck, Houston, and Elton G. Kaminski, Sidney, all of Ohio, assignors to The Stolle Corporation, Sidney, Ohio

Filed July 13, 1973, Ser. No. 379,096
Int. Cl. B05c *11/06*
U.S. Cl. 118—62 **6 Claims**



1. A can treating apparatus comprising a tube, an endless cable arranged to travel through said tube, a plurality of can carriers fixed to said cable to be transported through said tube thereby, the portion of the tube on the carrier side of said cable constituting a treatment chamber; a first series of nozzles arranged to project the fluid against the outside of the walls of cans being transported by said carrier, a second series of nozzles arranged to project the fluid downwardly onto the tops of the said cans, and a third series of nozzles arranged to project the fluid upwardly into the insides of said cans, the force of the projection of fluid upwardly from said third series of nozzles being sufficient to overbalance the projection from

said second series of nozzles and the weight of the can; the portion of the tube on the other side of said cable constituting a drain manifold for said fluid; said carriers being in the form of half cylinders of a diameter providing a clearance around the outside of the cans being treated, and having a drain opening substantially centrally thereof communicating with said drain manifold, and having a plurality of protuberances on their inside surface to maintain the axial position of the cans in the carriers to insure said clearance; whereby flow of fluid around both sides of each can results in complete and uniform treatment of the entire surface of each can.

3,854,446

APPARATUS FOR WET TREATMENT OF SHEET OR STRIP MATERIAL

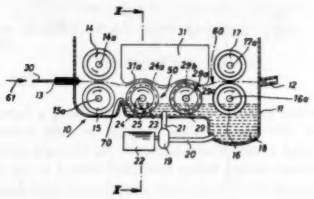
Emile Frans Stievenart, Antwerp; Hugo Frans Deconinck, Deurne Zuid, both of Belgium, and Jurgen Muller, Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverhausen, Germany

Filed May 23, 1973, Ser. No. 363,079

Claims priority, application Germany, May 26, 1972, 2225637

Int. Cl. B05c *1/08*

U.S. Cl. 118—223 **13 Claims**



1. In an apparatus for wet treatment of running sheet or strip material, combination comprising a vessel for a supply of treating liquid, said vessel having an inlet for introduction and an outlet for evacuation of material whereby the material which travels lengthwise between said inlet and said outlet advances along a predetermined path; at least one elongated roll mounted in said vessel and including an elongated hollow cylindrical housing having a peripheral surface contacting the material in said path, an internal surface, at least one liquid-admitting first opening in the region of one end and at least one liquid-discharging second opening in the region of the other end thereof, said housing being rotatable about a substantially horizontal axis extending transversely of said path and at least a portion thereof dipping into said supply of liquid; and liquid conveying means including a feed screw provided in said housing and arranged to establish a flow of liquid from said first to said second opening, said feed screw having threads in at least partial sealing engagement with said internal surface of said housing.

3,854,447

APPARATUS FOR DEPOSITION OF SEMICONDUCTOR THIN LAYERS

Hiroyuki Kobayashi, Kawasaki, Japan, assignor to Matsushita Electric Industrial Company, Limited, Kadoma City, Osaka, Japan

Filed Oct. 18, 1973, Ser. No. 407,605

Claims priority, application Japan, Oct. 19, 1972, 47-105114

Int. Cl. B05c *3/00*

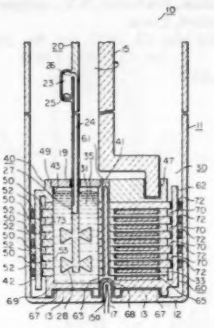
U.S. Cl. 118—421 **11 Claims**

1. Apparatus for depositing epitaxial layers on a plurality of substrates from a liquid phase, which comprises:

a refractory furnace;

a refractory tube disposable internally of said furnace;

an epitaxial growth boat disposable within said refractory tube, and provided with at least one cavity arranged axially thereof, a solution of material to be epitaxially grown on a plurality of substrates and stored in said at least one cavity, said boat comprising a plurality of flat members arranged on top of one another, each of said plurality of flat members having at least one recess for accommodating said substrate, alternate members of said plurality of flat members being arranged to be movable relative to the remaining flat members so that a plurality of substrate-solution contacts are accomplished.



3,854,448

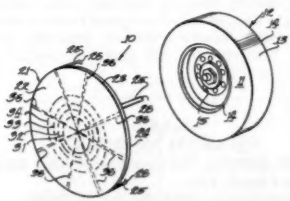
TIRE PROTECTOR

Dennis P. Kromanaker, 439 Cascoigne Dr., Waukesha, Wis. 53186

Filed Dec. 5, 1973, Ser. No. 422,531

Int. Cl. B05c *11/00*

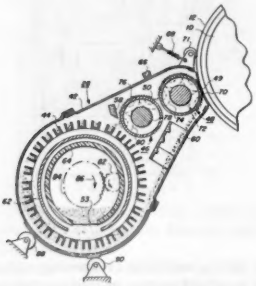
U.S. Cl. 118—505 **4 Claims**



1. A tire protector intended to provide a painting shield over the face surface of a tire about the wheel and wheel rim to permit painting of the wheel and rim without paint marring the appearance of the tire surface, the protector comprising a substantially flat circular disc shaped body member having a front surface, a back surface, and a peripheral circular edge surface, a plurality of different diameter concentric circles formed concentrically with said body member and defined by perforations extending partially through said body member and adapted for removal of an inner portion of said shield whereby to conform said shield to the inner diameter of the tire and whereby to permit painting of said wheel and rim, and a plurality of angularly spaced apart radially extending lines disposed in said body and defined by perforations extending partially through said body, said lines extending radially from the axis of said body to said outer edge thereof and adapted to permit radial separation of adjacent segments of said body for shaping said body to the contours of said tire face surface when applying said protector thereto, and means for detach-

ably securing said protector to said tire about said tire about said wheel and rim.

3,854,449
DEVELOPMENT APPARATUS
James R. Davidson, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 22, 1972, Ser. No. 255,259
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 **5 Claims**



1. An apparatus for rendering visible an electrostatic latent image, including:

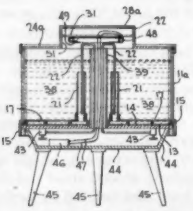
a housing having a chamber therein for storing particles;

means, mounted for movement in unison with said housing, for depositing particles onto the latent image;

means for advancing the particles from the storage chamber of said housing to said depositing means; and

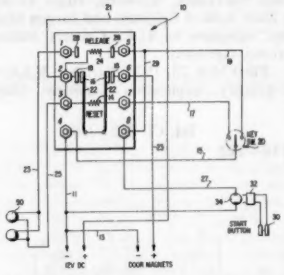
means, responsive to the latent image advancing to a first predetermined location, for moving automatically said housing from an inoperative position where said depositing means is spaced from the latent image to an operative position where said depositing means is closely adjacent to the latent image in operative communication therewith, said moving means in response to the latent image advancing to a second predetermined location after particles have been deposited thereon, returning automatically said housing from the operative position to the inoperative position.

3,854,450
AQUARIUM ASSEMBLY
Sam S. Puckett, Portland, Tex., assignor to Atlas Aquariums, Inc., Corpus Christi, Tex.
Filed June 8, 1972, Ser. No. 261,070
Int. Cl. A01k *64/00*
U.S. Cl. 119—5 **8 Claims**



1. An aquarium assembly comprising a transparent tank body, base plate means at one end thereof, an upright tube within said body and extending through said plate means at substantially the central portion thereof, at least two compartments within said body defined by at least one divider wall extending between said tube and the side wall of said body, a perforated filter plate in each said compartment spaced from said base plate means, and a filtration air tube for each said compartment extending upwardly through said tube.

3,854,451
STARTING GATE MASTER SWITCH AND CIRCUITRY
Leroy S. Mackey, Charles Town, W. Va., assignor to United Starting Gate Corporation, Tuckahoe, N.Y.
Filed Nov. 19, 1973, Ser. No. 417,229
Int. Cl. A63k *3/02*
U.S. Cl. 119—15.5 **3 Claims**

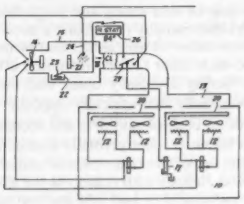


1. A starting gate for race tracks comprising a frame and a plurality of side-by-side stalls formed by said frame, door means pivoted to said frame adjacent the forward end of each stall, said door means being normally biased to an outward position to open the forward end of each stall, said door means being closeable and releaseably held by electromagnetic means in a circuit with a power source on said gate, said circuit including a bell signal, a relay coil with an armature and two pairs of contacts, a locking switch in said circuit to energize said relay and establish current to said electromagnetic means through a first pair of said contacts, a release coil with a pivotable armature latch in said circuit and said release coil being in communication with a starter switch, said pairs of contacts being alternatively connected by spring arm means which are normally biased to bridge a second pair of contacts, said pivotable armature in a first position latching said first pair of contacts in communication with one another to close the circuit to said electromagnet means and retain said door means in closed position, said starter switch being operable to energize said release coil and pivot said armature latch, breaking the circuit to said electromagnetic means whereby said arm means is released to bridge said second pair of contacts leading to the bell signal, said bell signal being activated substantially simultaneously with the release of said armature latch and said electromagnetic means which permits said door means to open said stalls.

3,854,452
INCUBATORS FOR EGGS
Michel Bardet, Tours, France, assignor to Buckeye Stephens Limited, Gloucester, England
Continuation-in-part of Ser. No. 196,463, Nov. 8, 1971. This application Mar. 29, 1973, Ser. No. 346,027
Int. Cl. A01k *41/04*
U.S. Cl. 119—37 **17 Claims**

1. An incubator having a chamber containing living eggs, the chamber having single air passages for respectively admitting and allowing output of air respectively, including drive means for impelling air into the chamber, a preconditioner conditioning the air before it is introduced into the chamber to preselected values of temperature and absolute humidity

lower than those desired in the running state of the chamber, and means controlling the rate of such introduction with



reference to wet bulb temperature sensed in the chamber, the said means including a damper variably obstructing a said air passage.

3,854,453

STEAM GENERATOR

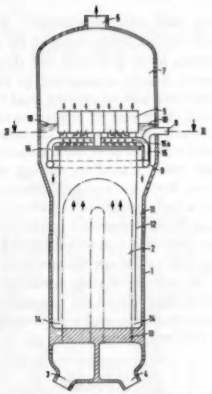
Hans Mayer; Heinz-Jurgen Schroder, and Gerhard Schucktanz, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 15, 1972, Ser. No. 306,939

Claims priority, application Germany, Nov. 17, 1971, 2157069

Int. Cl. F22b *1/06*

U.S. Cl. 122—32 **4 Claims**



1. A steam generator having a steam dome with a steam output line in its upper portion and a tank enclosure below said dome, a heat exchanger in said enclosure, a water separator in said steam dome and discharging water downwardly, and a feed-water inlet for said tank; wherein the improvement comprises means for distributing at least a portion of the feed-water from said inlet throughout the cross-sectional area of said separator.

3,854,454

HEAT PIPE WATER HEATER

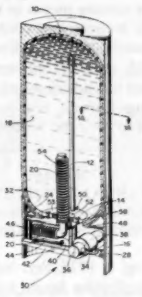
Lazaros J. Lazaridis, Lincoln, Mass., assignor to Therma Electron Corporation, Waltham, Mass.

Filed Nov. 1, 1973, Ser. No. 411,940

Int. Cl. F22b *1/02*

U.S. Cl. 122—33 **15 Claims**

1. A storage water heater comprising tank means for containing water, wherein the tank means comprises a plastic material; inlet means for bringing water into the tank means; outlet means for extracting water from the tank means; fossil fuel fired burner means external to the tank means for producing heat; and heat pipe means for transporting heat from the burner means to the interior of the tank means; the heat pipe means comprising a heat transfer fluid, an evaporator exterior



to the tank means heated by the burner means for evaporating the heat transfer fluid, a condenser located within the tank means and immersed in the water for condensing the heat transfer fluid, and transitional means between the evaporator and the condenser for transportation of hot heat transfer vapor from the evaporator through a wall of the tank means to the condenser.

3,854,455

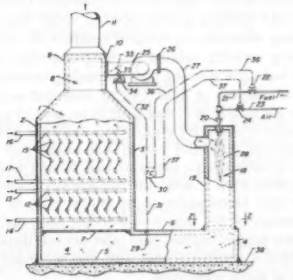
HEATING SYSTEM PROVIDING CONTROLLED CONVECTIVE HEATING

Don B. Carson, Mt. Prospect; Steven R. Orfanedes, and Kurt J. Zentner, Jr., both of Arlington Heights, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 17, 1973, Ser. No. 425,472

Int. Cl. F23b *21/24*

U.S. Cl. 122—356 **8 Claims**



1. A heating system for heat sensitive fluids to provide uniform heating for the tube banks therein and preclude excessive fluid film temperatures for the fluids passing through the individual tubes, which comprises in combination, a confined tube heating section, a plurality of interconnected small diameter tubular members positioned in said section to provide at least one tube bank therein, inlet and outlet means to the latter to provide for the flow of at least one fluid stream therethrough, at least one combustion section with burner and fuel supply means connective therewith to provide for the introduction of hot combustion gases into the interior of such section, duct means connecting between said combustion section and the lower end of said heating section to provide for a hot gas convective heating stream to said tubular mem-

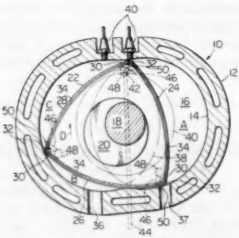
bers therein, waste gas outlet means from the top of said heating section, gas recycle duct means connective between said gas outlet means and said combustion section to provide for waste gas stream mixing with the hot combustion gases therein, gas stream blower means connective with said gas recycle duct means to provide for the pressurized introduction of the recycled waste gas stream into said combustion section and a pressurized convective heating gas flow to said heating section, temperature sensing means in the heating gas stream path to said heating section, and control means connecting with said sensing means and with a flow regulating means in turn connecting with at least one temperature controlling stream being supplied to said combustion section, whereby to regulate temperature for the hot gas convective heating stream being passed to the tube heating section.

3,854,456

ROTARY INTERNAL COMBUSTION ENGINES

Hideto Ishii, and Hideki Konishi, Tokyo, Japan, assignors to Nissan Motor Company, Limited, Kanagawa-ku, Yokohama, Japan

Filed Aug. 1, 1973, Ser. No. 384,423
Claims priority, application Japan, Aug. 2, 1972, 47-91367
Int. Cl. F02b *53/00*
U.S. Cl. 123—8.45 **5 Claims**



1. A rotary internal combustion engine, comprising in combination a housing having axially spaced end walls and a multilobed peripheral wall therebetween having a basically epitrochoidal inner surface, a multiapexed rotor disposed within said housing whereby on relative rotation of said rotor and said housing variable volume working chambers are formed, said rotor having a working face extending between each pair of adjacent apexes, at least one of said end walls having a secondary air supply port disposed in an area of said end wall that is always covered by said rotor, said rotor having at least one passageway, and inlet port in at least one end face of said rotor that is adjacent to said end wall having said secondary air supply port, each at least one passageway leading from said inlet port and terminating at an outlet port in the trailing corner portion of the adjacent working face opening to the adjacent working chamber, said inlet port so disposed in said end face that it communicates with said secondary air supply port once in each revolution.

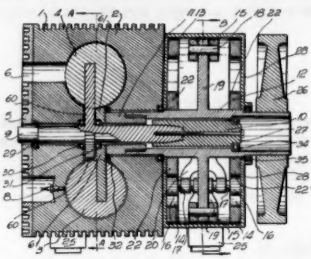
3,854,457

ROTARY ENGINE

Eduardo H. Taurozzi, Junin, Argentina, assignor to Armando Taurozzi; Juan Carlos Taurozzi and Santiago Sanchez Elia, all of Buenos Aires, Argentina, part interest to each

Filed Oct. 6, 1972, Ser. No. 295,497
Claims priority, application Argentina, Oct. 11, 1971, 238429
Int. Cl. F02b *55/14*
U.S. Cl. 123—8.47 **6 Claims**

1. In a rotary engine, a combination comprising two rotary independent coaxial shafts; stationary means defining a toroidal chamber extending about the axis of said shafts; two pairs of pistons displaceable in one direction of rotation in said chamber and one pair with respect to the other pair; means for respectively connecting one pair of said pistons to each other and to one of said shafts and the other pair of said pistons to each other and to the other of said shafts; a first pair of arms integral with one of said shafts and projecting substantially opposite each other radially therefrom; a second pair of arms integral with the other of said shafts and projecting substantially opposite each other radially from said other shaft, each of said arms having a radially outer end; only two rollers arranged substantially diametrically opposite to each other between the outer ends of said first and second pair of arms; a pair of links for each roller pivotally connecting the respective roller to the respective outer ends of said arms so that said rollers may move radially with respect to the axis of said shafts upon angular movement of said first and second pairs of arms with respect to each other; stationary endless cam means



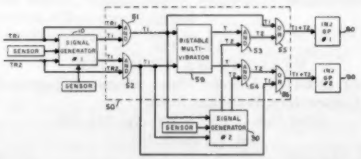
extending about said axis substantially in a plane normal thereto, said cam means being engaged by said rollers; one of said pair of pistons leading in said one direction of rotation, and inertia means fixedly connected to that shaft which is connected to said one pair of pistons, said one pair of pistons defining with said other pair of pistons in said toroidal chamber two diametrically opposite main chambers, and two opposite further chambers; first port means successively communicating with said main chambers during movement of said pistons in said one direction and expansion of said main chambers for feeding a fuel mixture into the respective main chamber; fuel mixture firing means for igniting said mixture in the respective main chamber; and second port means successively communicating with said main chambers for discharging combustion gases therefrom during contraction of said main chambers, said further chambers expanding during contraction of said main chambers and vice versa but do not receive fuel from said first port means.

3,854,458

FUEL INJECTION CONTROL SYSTEM

Junuthula N. Reddy, Horseheads, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 80,861, Oct. 15, 1970,. This application June 16, 1972, Ser. No. 263,579
Int. Cl. F02b *3/00*
U.S. Cl. 123—32 EA **15 Claims**



1. In an internal combustion engine fuel control system of the type having trigger signal generating means for generating

a signal indicative of engine speed, a plurality of engine parameter sensors, a first pulse generator means responsive to the trigger signal generating means and to a first sensor operative to generate a first generator signal, a second pulse generator means responsive to the first generator signal and to a second sensor operative to generate a second generator signal, each of the first and second generator signals having frequencies dependent upon the triggering frequency and pulse durations dependent upon the sensor inputs, and a plurality of sequentially actuated injector valve means, the improvement comprising switching means for applying the first and second generator signals to the plurality of injector valve means in a sequence whereby the open times of consecutive injector valve means in the sequence may overlap comprising:

first gating means responsive to the first and second pulse generator means, operative to apply consecutive first and second pulse generator means pulses to selected injector valve means;

further pulse generator means responsive to said first pulse generator means operative to generate signals having at least one frequency dependent upon the triggering frequency and a pulse duration substantially corresponding to the time interval between the terminations of consecutive first generator signal pulses; and

second gating means responsive to said further pulse generator means pulses operative to apply second generator signal pulses to said first gating means in a manner determined by said further pulse generator means signal.

3,854,459

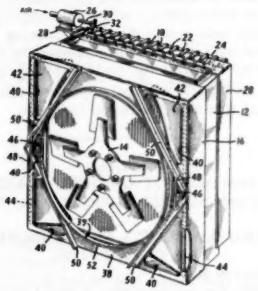
FAN SHROUD FOR AN ENGINE COOLING SYSTEM

David F. Stimeling, Whitehall, Pa., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Dec. 28, 1973, Ser. No. 429,627

Int. Cl. F01p *7/02*

U.S. Cl. 165—39 **12 Claims**



1. In a cooling system for an internal combustion engine including a fan and closable shutter means for controlling a flow of air to the fan, the improvement comprising:

a fan shroud defining at least a portion of a passageway extending from the shutter means to the fan, the shroud encircling the fan and including an opening affording a free path of flow for air moving through the passageway from the shutter means and being exhausted from the fan, at least one vent being formed in the shroud, and automatic means for closing the vent when the shutter means is open and the fan is operating and for opening the vent when the shutter means is closed and the fan is operating.

3,854,460

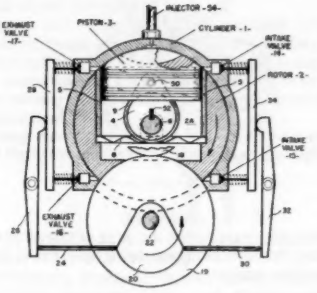
ROTO-PISTON INTERNAL COMBUSTION ENGINE

George M. Raptis, 17876 Vicino Way, Pacific Palisades, Calif. 90272

Filed Mar. 19, 1973, Ser. No. 342,891

Int. Cl. F02b *57/00*

U.S. Cl. 123—44 R **5 Claims**



1. An internal combustion engine comprising: a cylindrical casing having a longitudinal axis; a rotor coaxially supported within said casing for rotation about said longitudinal axis, said rotor having a radial pocket formed therein; at least one piston slidably mounted in said radial pocket of said rotor and reciprocally movable therein for rotation of said rotor; a sleeve slidably mounted in said pocket in coaxial relatonship with said piston; resilient means biasing said sleeve against the inner wall of said cylinder to form a compression seal therewith; a stationary shaft extending along the longitudinal axis of said cylinder and across said pocket; connecting means coupled to said stationary shaft and to said piston to produce rotation of said rotor about said stationary shaft as said piston is moved reciprocally in said pocket; a drive shaft rotatably mounted in said casing along the longitudinal axis thereof and disposed in linear axial relationship with respect to said stationary shaft; means keying said rotor to said drive shaft; and intake and exhaust valves mounted on said casing in communication with said radial pocket.

3,854,461

VACUUM UNITS

Norman Alfred Jukes, Walsall, England, assignor to Joseph Lucas (Electrical) Limited, Birmingham, England

Filed Jan. 15, 1973, Ser. No. 323,362

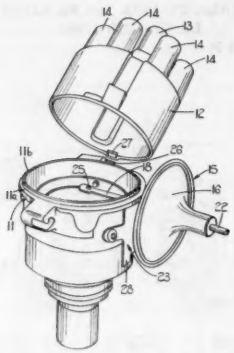
Claims priority, application Great Britain, Jan. 15, 1972, 2045/72

Int. Cl. F02p *5/04*

U.S. Cl. 123—117 A **4 Claims**

1. A vacuum unit (as claimed in claim 1 wherein), for an ignition distributor, including a housing divided internally into first and second chambers by a diaphragm, a connecting link secured at one end to the diaphragm and extending from the first chamber for connection, in use, to the timing plate of an ignition distributor, and a bracket secured to the housing and whereby the unit can be secured in position on the casing of an ignition distributor, the bracket (is) being so shaped as to permit two alternative positions of the unit relative to the casing of the distributor, one position providing clockwise rotation of the timing plate of the distributor as the connecting link is withdrawn by the unit in use, and the second position providng anti-clockwise rotation of the timing plate as the connecting link is withdrawn in use, the bracket being provided with a pair of location members one or other of which is engageable, in use, by the detachable insulating cap of the distributor so as to locate the cap angularly in the desired

position on the distributor casing, (for the distributor cap) oneof the pair being operative in said one position of the



bracket and the other of the pair being operative in the second position of the bracket.

3,854,462

MIXTURE PREPARATION INSTALLATION FOR A MULTI-CYLINDER INJECTION INTERNAL COMBUSTION ENGINE

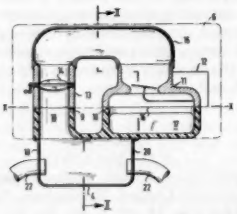
Robert Binder, Schwieberdingen, Germany, assignor to Firma Dr.-Ing. h. c. F. Porsche KG, Stuttgart-Zuffenhausen, Germany

Filed Oct. 13, 1972, Ser. No. 297,228

Claims priority, application Germany, Oct. 14, 1971, 2151187

Int. Cl. F02m *51/00*

U.S. Cl. 123—119 R **13 Claims**



1. A mixture preparation installation for a multi-cylinder injection-type internal combustion engine having a suction system, said installation comprising: an air filter housing, a filter insert disposed in a portion of said air filter housing, a fuel injection means operating with continuous injection operatively connected with said air filter means including a control housing, measuring means disposed in said control housing for controlling the fuel metering action in dependence on the air quantity flowing through the suction system, connecting means for connecting said control housing with the suction system, a valve means including a throttle valve disposed in said connecting means for controlling the air flow therethrough, said connecting means, the portion of said filter housing in which said filter insert is disposed and said control housing being disposed adjacent one another, said air filter housing, said control housing and said connecting means being provided with sealing surfaces disposed substantially in a common plane, said control housing and said connecting means being disposed on the sealing surface of said air filter housing.

3,854,463

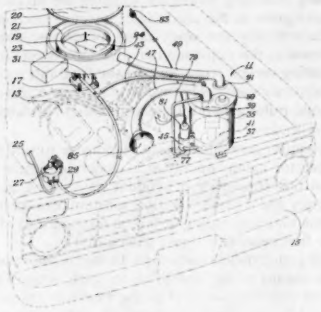
EFFICIENCY INCREASING ANTI-POLLUTION CONTROL DEVICE

Henry Owen Burden, Sr., 1521 Pinto St., Dallas, Tex. 75211

Filed July 24, 1973, Ser. No. 382,123

Int. Cl. F02m *17/18*

U.S. Cl. 123—133 **19 Claims**



1. Apparatus for supplying a combustion mixture to an internal combustion engine having conventional accessories, including an intake manifold, comprising:

a. a carburetor having an air intake passageway, a liquid fuel supply and liquid fuel passageways for supplying liquid fuel to the air being taken into said internal combustion engine, and an effluent passageway that is connected with the intake manifold on said internal combustion engine; said carburetor being connected with a control, such as an accelerator pedal, and adapted for conventional operation of said internal combustion engine; and

b. evaporating and admixing means for effecting complete vaporization of liquid fuel and for admixing the resulting fuel vapor with a portion of the air being supplied to said carburetor; said evaporating and admixing means being connected with said air intake passageway of said carburetor; said evaporating and admixing means being adapted to supply only fuel vapor and not atomized or liquid fuel that would burn incompletely.

3,854,464

TOOL FOR ADJUSTING DIESEL GOVERNORS

Edward J. Reinhard, 2524 S. Fickett Ave., Tucson, Ariz. 85713

Filed Oct. 12, 1973, Ser. No. 406,033

Int. Cl. F02d *11/00*

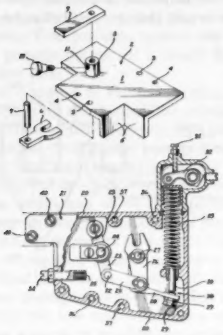
U.S. Cl. 123—140 R **4 Claims**

1. Apparatus for use in tuning a diesel governor, which governor includes: (i) a housing containing lubricating oil and having removable cover means, (ii) mechanical linkages for controlling and correlating engine speeds, and (iii) governor adjustment means; said apparatus comprising in combination:

a. auxiliary cover means for temporarily replacing said removable cover means while the governor is being tuned, said auxiliary cover means including: (i) a sealed passage allowing physical access to said governor adjustment means while substantially containing fugitive lubricating oil within said housing, and (ii) a tuning passage; and

b. tuning means for controllably maintaining engine speed at a desired level, said tuning means including: (i) displacement means for mechanically engaging said mechanical linkage within said housing, (ii) control means connected to said displacement means through said tuning passage for translating selected mechanical displace-

ment outside said housing into corresponding changes in the position of said translation means, and (iii) locking



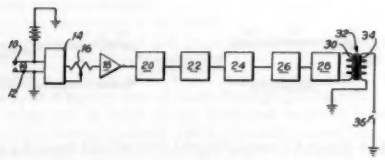
means for securing said displacement means in a selected position during the adjustment of said governor.

3,854,465

ELECTRONIC IGNITION SYSTEM

Guy Adams, Monroe, N.Y., assignor to Solitron Devices, Inc., Tappan, N.J.

Filed May 22, 1972, Ser. No. 255,396
Int. Cl. F02p *3/02, 5/08*
U.S. Cl. 123—148 E **10 Claims**



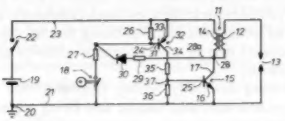
1. An engine ignition system comprising:
an electrical source;
first means connected to said source and operable in response to engine operation for generating an impulse signal of predetermined time duration;
second means connected to said first means for receipt of said impulse signal and operable to change a square waveform of said impulse signal to a non-linear sloping waveform for said time duration of said impulse signal, said non-linear sloping waveform of said second means terminating upon termination of said square waveform of said impulse signal;
third means operatively connected to said second means to vary the gradient of said non-linear sloping waveform within the time duration of said square waveform of said impulse signal to provide a faster or delayed rise of the non-linear sloping waveform from said second means whereby control of the position of a triggering potential therefrom is possible for proper timing of the engine ignition system;
fourth means connected to said third means and energized by the triggering potential to generate a signal within the time duration of said impulse signal and displaced in time from the inception of said impulse signal in accordance with the triggering potential on the non-linear sloping waveform to be of a duration of time within said predetermined time duration of said impulse signal of said first means;
fifth means connected to said fourth means providing a switching signal within said time duration of said impulse signal of said first means;
an ignition coil connected to said electrical source and switching means whereby charging of a primary winding of said coil is controlled by said switching means to control transmission of a high energy potential from a secondary winding of said coil within said time duration of said impulse signal; and
spark plug means connected to said coil to be activated by said high energy potential to provide engine ignition.

3,854,466

IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Diedrich Steinberg, Stuttgart; Winfried Jahnke, Ludwigsburg; Helmut Roth, Stuttgart; Walter Ruf, Munchingen; Ulrich Steinbrenner, Stuttgart, and Hans Linstedt, Reutlingen, all of Germany, assignors to robert Bosch GmbH, Stuttgart, Germany

Filed July 19, 1972, Ser. No. 273,185
Claims priority, application Germany, July 24, 1971, 2137204
Int. Cl. F02p *1/00*
U.S. Cl. 123—148 E **41 Claims**



1. In an ignition system for an internal combustion engine of the type including an ignition transformer comprised of a primary winding and a secondary winding and spark producing means connected across said secondary winding, in combination therewith, a rotary element driven by and rotating in synchronism with the engine; an ignition breaker switch coupled to said rotary element and arranged to be open during first time intervals corresponding to first predetermined ranges of angular positions of said rotary element and to be closed during second time intervals alternating with said first time intervals and corresponding to second predetermined ranges of angular positions of said rotary element; switching means connected in the current path of said primary winding and operative when open for preventing flow of current through said primary winding through such current path and operative when closed for permitting flow of current through said primary winding through such current path; first circuit means connected between said ignition breaker switch and said switching means and normally operative for causing said switching means to open when said breaker switch opens and for causing said switching means to close when said breaker switch closes; and second circuit means connected to said first circuit means and operative if due to faulty operation said breaker switch briefly closes during one of said first time intervals for maintaining said switching means open despite such brief closing of said breaker switch.

3,854,467
FORCE MULTIPLYING TYPE ARCHERY BOW

Russell Hofmeister, Waseca, Minn., assignor to Herter's, Inc., Waseca, Minn.

Filed Mar. 14, 1974, Ser. No. 451,212
Int. Cl. F41b *5/00*
U.S. Cl. 124—24 R **4 Claims**

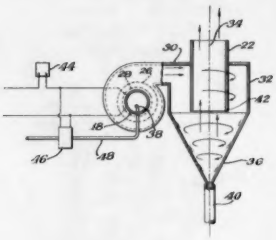
1. An archery bow comprising:
an elongate handle member having spaced apart ends,
a pair of elongate resilient limbs connected to the ends of said handle member and projecting outwardly therefrom, said limbs having free terminal ends,
a bowstring support means mounted on said limbs adjacent the free terminal ends thereof,
a pair of similar eccentric sheaves, each eccentric sheave of said pair of eccentric sheaves being revolvably mounted on said handle immediately adjacent each end thereof, a pair of concentric sheaves, each concentric sheave of said pair of concentric sheaves being fixedly connected to an associated one of said eccentric sheaves and revolvable therewith,
a bowstring assembly having opposite free ends thereof connected with said handle and being trained about said spaced apart eccentric sheaves and about said bowstring support means and defining a nocking stretch between said bowstring support means, said nocking stretch being movable between drawn and rest positions, said eccentric sheaves being revolvable in response to movement of the nocking stretch between the drawn and rest positions,
an elongate flexible, endless connecting cable trained about said spaced apart concentric sheaves to define a pair of stretches which cross each other and cooperating with said concentric sheaves to cause said eccentric sheaves to rotate in unison in response to movement of the nocking stretch between drawn and rest position.

3,854,468
VORTEX HUMIDIFIER FOR FORCED FLOW HOT AIR FURNACE

Michio B. Nozaki, Lagrange, Ill., assignor to Rheem Manufacturing Company, New York, N.Y.

Continuation of Ser. No. 218,395, Jan. 17, 1972, abandoned. This application Sept. 4, 1973, Ser. No. 393,849
Int. Cl. F24h *3/00*
U.S. Cl. 126—113 **5 Claims**

1. Humidifier apparatus for evaporating water in a heated air flow comprising, in combination:
a water supply conduit;
a flow passage for heated air;
fan means in said passage for moving hot air therethrough;
water vaporization means in said passage connected with said conduit for vaporizing water in the flow of hot air;
a vortex chamber connected with said passage down stream from the water vaporization means, said chamber including a frusto conical portion with a wide upper end, a narrow lower end and an axis of revolution, said passage being tangentially connected with said chamber adjacent the upper end to induce a circular flow of hot air and water vapor in said chamber, said chamber also including

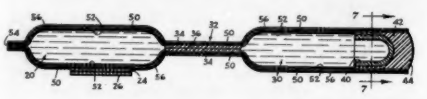


an outlet tube extending axially from the interior of said chamber to provide a humidified hot air outlet;
a drain at the lower end for collecting unevaporated water; and
means on the interior surface in said frusto conical portion for effectively increasing the surface area of said interior surface to move effectively promote evaporation of water.

3,854,469
EPIURETHRAL VALVE

Francis A. Giori, Clarence, and Alvin S. Topolski, Tonawanda, both of N.Y., assignors to Electro Sciences for Medicine, Inc., Clarence, N.Y.

Filed Oct. 31, 1972, Ser. No. 302,602
Int. Cl. A61b *19/00;* **A61f** *01/00*
U.S. Cl. 128—1 R **8 Claims**



1. A device for controlling the flow of fluid through a physiological vessel such as the flow of urine through the urethra comprising:
a. first inflatable means defining a chamber initially containing fluid and adapted to be positioned in operative relation to the outer surface of the vessel;
b. second inflatable means defining a chamber for containing fluid, said second inflatable means being of a size sufficient to store fluid initially contained in said first inflatable means;
c. pressure responsive valve means joining said first and second inflatable means, said valve means including a single, common passage means for placing said chambers of said first and second inflatable means in direct fluid communication, said passage means being opened when a fluid pressure difference exists between said first and second inflatable means to allow fluid normally to flow at a relatively low rate between said chambers until a pressure equilibrium therebetween exists at which time said passage closes, the time during which said passage is opened being a function of the length and cross-sectional dimension of said passage, and said valve means allowing said passage means to open in a manner allowing fluid to flow at a relatively high rate in response to sufficiently high pressure applied thereto; and

d. said first and second inflatable means being of predetermined and relative size such that initially a pressure equilibrium condition exists therebetween and said first inflatable means contains a sufficient amount of fluid to apply sufficient pressure against the vessel to prevent flow of fluid therethrough and said second inflatable means while storing fluid initially contained in said first inflatable means applies fluid pressure against said valve means to open said passage means for a return fluid flow at said relatively low rate;

e. whereby in response to manual pressure applied by the patient through his skin to said first inflatable means fluid is caused to flow at said relatively high rate from said first inflatable means through said passage means of said valve means and into said second inflatable means thereby deflating said first inflatable means to relieve the pressure against the vessel and allow it to permit fluid to flow therethrough and upon release of the pressure applied to said first inflatable means said second inflatable means applies fluid pressure against said valve means thereby allowing fluid to return from said inflatable means through said passage means to said first inflatable means at said relatively low rate whereupon after a predetermined time a pressure equilibrium again exists between said first and second inflatable means and said first inflatable means again contains a sufficient amount of fluid to apply sufficient pressure against the vessel to prevent flow of fluid therethrough.

3,854,470
REPRODUCTION PROCESSES FOR CELLULAR BODIES

Lynn Lawrence Augspurger, 642 Fairfax, Birmingham, Mich. 48009

Filed Nov. 23, 1973, Ser. No. 418,604
Int. Cl. A61k *17/00, 17/06*
U.S. Cl. 128—1 R **100 Claims**

1. A process for embyro transplantation for increasing the number of progeny of female omnivorous and herbivorous hoofed mammal donors comprising,

inducing superovulation in a desired donor by administration of gonadotrophin,

receiving the ova from the donor,

placing the recovered ova in tirrus culture medium and storing the recovered ova for a period of time,

preparing recipients of prospective transplantations and determining the time of ovulation in the recipients,

selecting one or more of the individual ovum or cellular bodies from said stored ova in said culture medium,

transplanting selected individual ovum or cellular bodies derived from said donor to a selected recipient at a time corresponding to a synchronization

of the individual ovum or cellular bodies transplanted and the time of normal fertilization of the recipient such that the transplant is synchronized at the blastocyst stage in the recipient at the time the recipient would normally implant a blastocyst had the recipient been fertilized.

3,854,471
ULTRASONIC METHOD FOR SYSTEMATIC SEARCH AND DETECTION OF TISSUE ABNORMALITIES

John J. Wild, 1100 E. 36th St., Minneapolis, Minn. 55407

Filed Sept. 15, 1972, Ser. No. 289,359
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 V **8 Claims**

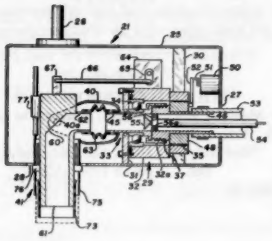
1. Method for systematic examination and detection of tissue abnormalities including:

a. providing an ultrasonic energy transmitting source to provide a tissue intercepting beam and receving source therefor;

b. positioning said source in close association to the tissue to be examined;

c. moving said source in a first predetermined direction over the tissue in a path;

d. oscillating said beam of energy in a first plane, said first plane being substantially coincident with and in the same direction of movement of said source across the tissue; said oscillating beam of energy being simultaneously transmitted in a second plane generally normal to said first plane and therefore generally normal to the directions of movement across the tissue;



e. continuing moving the source and its beam oscillations in different but closely adjacent paths;

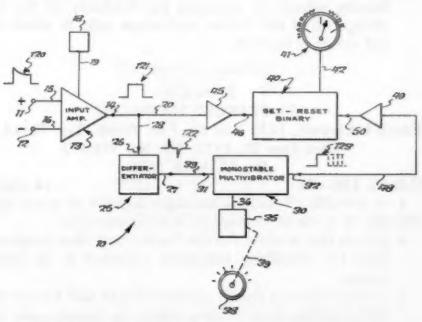
f. providing interpretation means for the instantaneous processing and readout of said beam energy receiving means and,

g. said interpretation means including means for quantitatively reading the energy returned from the tissue whereby conversion of such energy to a delayed visual form is eliminated.

3,854,472
PULSE COMPARATOR

Francis A. Giroi, Clarence, and Anthony J. Ditusa, Williamsville, both of N.Y., assignors to Electro Sciences for Medicine, Inc., Clarence, N.Y.

Continuation-in-part of Ser. No. 84,646, Oct. 28, 1970, abandoned. This application Apr. 20, 1973, Ser. No. 353,118
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 A **15 Claims**



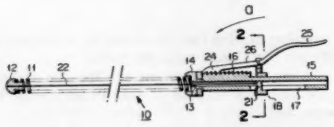
1. Physiological monitoring apparatus for measuring the pulse width of an electrical signal occurring in the body of a patient comprising:

a. sensing electrode means adapted to be operatively connected to the body of a patient;

b. comparison means having first and second inputs and responsive to input pulse time duration for providing an indication of relative pulse width, said comparison means including means for maintaining said indication until another input pulse arrives;

c. means for coupling said sensing electrode means to one input of said comparison means;
d. means for producing a reference pulse of known time duration, said reference pulse producing means being coupled to adjustable means whereby the time duration of the reference pulse can be varied; and
e. means for applying the output of said reference pulse producing means to the other input of said comparison means;
f. whereby said comparison means provides an indication of whether the time duration of the signal occurring in the body of a patient is less than or greater than the duration of the reference pulse and said comparison means maintains the indication until another comparison is made.

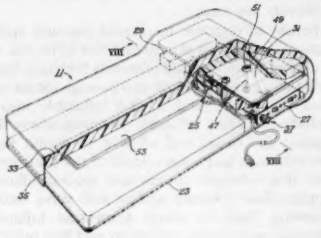
3,854,473
STILET FOR ENDOSCOPES
Kazumasa Matsuo, Tokyo, Japan, assignor to Olypus Optical Co., Ltd., Tokyo, Japan
Filed May 29, 1973, Ser. No. 364,258
Int. Cl. A61b *1/06, 1/26*
U.S. Cl. 128—8 **9 Claims**



1. A stilet for varying the flexibility of an endoscope comprising:
a coil spring having a central axis, said coil spring being adapted to be inserted in the flexible tube of an endoscope,
a retracting wire inserted through the coil spring substantially along said central axis, one end of the wire being operatively connected to one end of the coil spring, and adjusting means provided on the other end of the coil spring and coupled to the other end of the wire to selectively tighten said wire relative to the coil spring to compress adjacent turns thereof closer to each other to stiffen the coil spring, or to retract and loosen the wire relative to the coil spring to render the spring more flexible, thereby selectively adjusting the flexibility of the coil spring and of the flexible endoscope tube in which the coil spring is inserted.

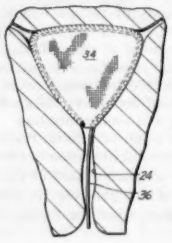
3,854,474
ALL-PURPOSE MASSAGER
Edwin I. Carruth, 1416 Yale St., Fort Worth, Tex. 76114
Filed June 25, 1973, Ser. No. 373,103
Int. Cl. A61h *1/00*
U.S. Cl. 128—33 **14 Claims**

1. A portable all-purpose massager capable of supplying a plurality of levels of massage intensity comprising:
a. a base that is more flexible transversely than longitudinally for amplifying vibrations imparted to its lateral center;
b. a motor-vibrator fixedly connected with said base at said lateral center for imparting vibrations thereto; said motor-vibrator having means for connecting with a power source and having controls that are accessible to a user;
c. first and second counterweights fixedly attached to said base adjacent each side edge for further amplifying predetermined vibrations imparted to said transversely flexible base;
d. a head member disposed above said motor-vibrator and said counterweights; said head member also being more flexible transversely than longitudinally for amplifying said predetermined vibrations imparted to its lateral center; said head member being connected with said base at a plurality of points spaced respectively along respective longitudinally extending lines located one on each side of and laterally intermediate said motor-vibrator and each side edge of said base and said head member;



e. a layer of padding material on the front side of said base and said head member for effecting a soothing soft side; and
f. a cover enclosing said layer of padding material and said base; said cover being immediately adjacent said base without intervening padding on the back side of said base for effecting a penetrating hard side.

3,854,475
FEMALE CONTRACEPTIVE DEVICES
Louis Bucalo, Holbrook, N.Y., assignor to Investors in Ventures, Inc., New York, N.Y.
Filed Feb. 8, 1973, Ser. No. 330,621
Int. Cl. A61f *5/46*
U.S. Cl. 128—130 **8 Claims**



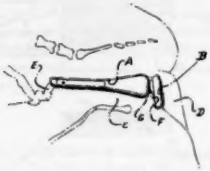
1. For use by an individual having a uterine cavity of a given size and shape, an IUD comprising at least one sheet of filamentary material having said size and shape outside of and independent of the uterine cavity so as to be capable of being situated in said cavity extending completely across the entire uterine cavity, said sheet being composed of longitudinally and transversely extending filamentary elements and said longitudinally extending elements, which extend in the general direction of the mouth of the uterus, including means rendering said longitudinally extending elements capable of longitudinal contraction and expansion in conformity with pulsating movements of the uterus.

3,854,476

INTRA-VAGINAL DEVICE AND METHOD

Ben Wade Oakes Dickinson III, 2125 Broderick St., San Francisco, Calif. 94115, and Robert Wayne Dickinson, 40 Maplewood Dr., San Rafael, Calif. 94901

Filed Apr. 5, 1973, Ser. No. 348,204
Int. Cl. A01k 21/00
U.S. Cl. 128—138 18 Claims



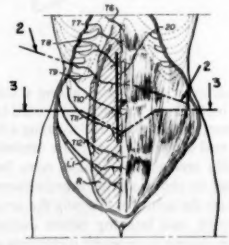
13. In a method of contraception employing long-term vaginal retention of a contraceptive device in an animal of the type having a vagina terminating at the posterior end in a normally closed vulva and at the anterior end in a normally closed cervix and having a defined sphincter muscle therebetween, utilizing the contraceptive device which includes an elongate member with an extension element, a flexible posterior disc, and coupling means therebetween, the steps of inserting the device totally within the animal's vagina with said extension element lying along the vaginal axis and with the disc posteriorly directed and contacting the vaginal wall about its periphery adjacent the sphincter muscle which inhibits insertion of the penis of the male, and permitting bypass of fluids, and retaining said device in said inserted position in the animal's vagina with flexing of the disc responsive to movement of the vagina for a substantial period of time for contraception.

3,854,477

APPARATUS AND METHOD FOR THE APPLICATION OF A CONTINUOUS SOMATIC NERVE BLOCK

Stuart L. Smith, 8796 W. Colfax Ave., Lakewood, Colo. 80215

Filed Apr. 6, 1973, Ser. No. 348,611
Int. Cl. A61m 5/14, 25/00
U.S. Cl. 128—213 12 Claims



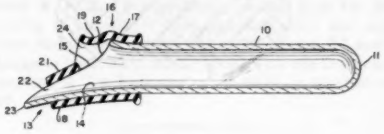
1. A method for placing the porous section of an infusion tube, having a porous section and a non-porous section, in the body wall of a patient, for applying an analgesic to control postoperative pain where somatic nerves are severed by an incision in the patient's body wall, which includes the steps of:
a. locating the paths of the nerves severed by the incision and selecting a course in the patient's body wall which traverses the severed nerves between the spinal column and the points of severance, which is spaced from the incision in undamaged tissue and which is located between layers of fascia and/or muscle adjacent to the somatic nerves to minimize disruption of body tissue and the amounts of analgesic needed to reach the nerves;
b. implanting the porous section of the infusion tube in the patient's body wall at the selected course and alongside the severed nerves, with the non-porous section of the tube extending from the patient's body wall at one end of the course; and
c. delivering fluid analgesic into the tube whereby the same will flow into the porous section within the patient's body wall and thence to tissue including nerves alongside the porous section of the tube.

3,854,478

MEDICATION SERVER AND GUARD

Dortha Cunningham, 2901 E. Hanna, Indianapolis, Ind. 46227

Filed Jan. 18, 1973, Ser. No. 324,670
Int. Cl. A61j 7/00
U.S. Cl. 128—222 5 Claims



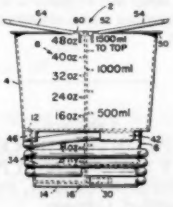
1. A medication server comprising a hollow stem closed at one end and merging at its other end with a spoon having a bowl, and a bite strip transversely spanning said bowl substantially at the level of the lateral edges of said bowl and wholly above the bottom of said bowl, said bite strip being provided by a collar circumscribing said stem and extending substantially midway of the length of said bowl and formed to provide an upper, part-peripheral, lip-receiving socket adjacent its distal end and opening into said bowl.

3,854,479

DEVICE FOR ADMINISTERING AN ENEMA

Robert T. Duke, Audubon, Pa., assignor to Fibre Formations, Inc., Philadelphia, Pa.

Filed Mar. 22, 1974, Ser. No. 453,670
Int. Cl. A61m 3/00
U.S. Cl. 128—227 6 Claims



1. A device for administering an enema comprising:
a bucket having a bottom, an upper wall, a connected lower wall of a smaller diameter than the upper wall, and a recess in the lower wall adjacent the bottom,
a discharge conduit in said recess and in communication with the interior of the bucket,
a flexible tube connected to said conduit and coiled about said lower wall between the discharge conduit and the upper wall, and
means on one of said walls to releasably hold the outer end of the tube to prevent the tube from uncoiling.

3,854,480

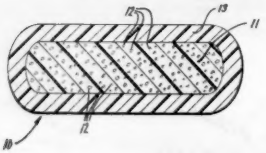
DRUG-DELIVERY SYSTEM

Alejandro Zaffaroni, Atherton, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. Nos. 812,116, April 1, 1969, , and Ser. No. 864,175, Oct. 6, 1969,. This application June 2, 1970, Ser. No. 42,786

Int. Cl. A61m *5/00*

U.S. Cl. 128—260 **11 Claims**



1. A drug-delivery system for the continuous and controlled administration of drug to a body comprising in combination:

a. a solid inner matrix material having solid particles of said drug dispersed therethrough, said inner matrix being permeable to passage of said drug by diffusion; and

b. an outer polymeric membrane, insoluble in body fluids, surrounding said inner matrix, said polymeric membrane characterized by being formed of a drug release rate controlling material which is permeable to passage of said drug by diffusion but at a rate which is lower than through said inner matrix material,

c. and wherein the system is so constructed and arranged that when placed in the environment of use, the outer polymeric membrane continuously meters the flow of drug from the inner matrix material to the exterior of the system at a controlled and constant rate over a prolonged period of time.

3,854,481

TAMPON HAVING AN INSERTION END OF LESSER DENSITY THAN THE BODY PORTION

Bernd Messing, Fischertal, Germany, assignor to Dr. Carl Hahn K.G., Dusseldorf, Germany

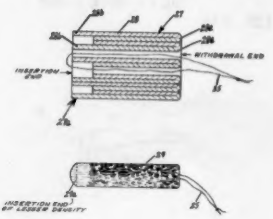
Continuation of Ser. No. 696,969, Dec. 26, 1967, abandoned. This application Dec. 2, 1970, Ser. No. 94,552

Claims priority, application Netherlands, Jan. 13, 1967, 6700538

Int. Cl. A61f *13/20*

U.S. Cl. 128—285 **6 Claims**

1. A rolled tampon having an insertion end and a withdrawal end, said tampon being made from a continuous non-woven fabric which is rolled about its longitudinal axis thereby forming a rolled body portion, said rolled body portion being radially compressed to a predetermined dense state, said insertion end having a non-woven fibrous portion protruding from said rolled body portion, the material of said insertion end being axially compressed, said axial compression being of such amount that the material of said insertion end has a density less than the density of the material of said rolled body



portion, thereby increasing the rate of absorption of said tampon.

3,854,482

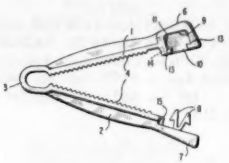
UMBILICAL CORD CLAMP

Lorene Laugherty, and James R. Laugherty, both of Knoxville, Tenn., assignors to Avis Research, Inc., Knoxville, Tenn.

Filed Nov. 22, 1972, Ser. No. 308,822

Int. Cl. A61b *17/08*

U.S. Cl. 128—346 **5 Claims**



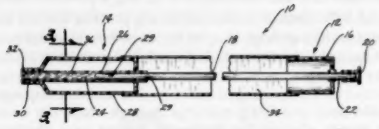
1. An umbilical cord clamp comprising a substantially V-shaped member including a pair of arms joined together at the apex by a loop integral therewith and forming a hinge between the arms at one end thereof and with the opposite ends being free and normally spaced apart, said arms being movable toward each other to clamp a cord therebetween, and means on the free ends on the arms for latching the arms in clamping relation to the cord, said latching means including a pair of hooks on one arm facing in opposite directions and a box-like socket on the free end of the other arm having an entrance opening facing the hooks, said entrance opening having shoulders on opposite sides thereof in the direction of the hooks, the hooks having diverging shanks of yieldable material and with engaging faces in positions to overlap the respective shoulders when the latching means is in closed relation, said hooks having means thereon in position to engage the shoulders at the entrance opening yieldably to move the hooks toward each other during passage through the entrance opening thereby compressing the hooks toward each other and after passage through the opening the yieldable shanks of the hooks causing lateral expansion thereof apart into overlapping relation with the respective shoulders, the box-like socket being open at the lateral side for access laterally to the hooks.

3,854,483

URETHRAL INTRODUCTION CATHETER

Jerry G. Powers, 1621 Post Dr., Omaha, Nebr. 68114

Filed Oct. 9, 1973, Ser. No. 404,388
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 R 7 Claims



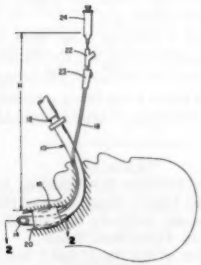
1. A urethral introduction catheter comprising,
an elongated flexible catheter having distal and proximal ends,
a connector secured to said catheter adjacent the proximal end thereof,
said catheter having a drain spout portion extending from said connector,
an introducer having a catheter introducer end portion extending therefrom,
a sterile lubricant in said introducer,
the distal end of said catheter being movably received by said introducer and slidably received by said introducer end portion so that the sterile lubricant is pushed from said introducer into the patient's urethra as the catheter is inserted into the patient's urethra,
and a flexible sheath secured at its proximal end to said connector and secured at its distal end to said introducer.

3,854,484

ENDOTRACHEAL TUBE WITH LIQUID FILLABLE CUFF

Richard R. Jackson, Eight Trinity Rd., Marblehead, Mass. 01947

Continuation-in-part of Ser. No. 191,708, Oct. 22, 1971, Pat. No. 3,766,927. This application Nov. 28, 1972, Ser. No. 310,129
Int. Cl. A61m *25/00*
U.S. Cl. 128—351 11 Claims



1. A tracheal tube device comprising a tube sized for introduction of air through the trachea into the lungs of a living being, a cuff member surrounding and secured to said tube and adapted to be filled with liquid to cause extension of said cuff into sealing contact with tracheal tissue about said cuff to create a seal between said tube and the trachea and a filling lumen extending proximally from said cuff for communication with a source of filling liquid, the improvement wherein said cuff comprises a material which in the presence of said liquid is permeable to air and substantially nonpermeable to said liquid at the normal pressure said liquid exerts upon the interior of said cuff while creating said seal.

3,854,485

TOBACCO COMPOSITIONS COMPRISING MONO-ESTERS OF MONO- AND DIALKYLMALONATES

James D. Mold; Andrew G. Kallianos; Richard E. Means, all of Durham, N.C., and Melvyn I. Simpson, Kentfield, Calif., assignors to Liggett & Myers Incorporated, New York, N.Y.

Filed Sept. 24, 1973, Ser. No. 399,981
Int. Cl. A24b *15/04*
U.S. Cl. 131—17 R 9 Claims

1. Tobacco smoking compositions comprising tobacco and a small but effective amount of at least one monoester of mono- and di-alkylmalonates having the formula:

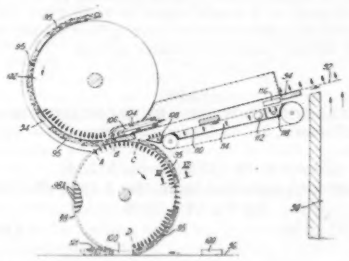
wherein R, R′ are independently selected from the group consisting of straight or branched-chain alkyl and aralkyl radicals having from one to eight carbon atoms, R″ is either hydrogen or lower alkyl radical having from one to six carbon atoms, and R‴ is hydrogen or an alkali or alkaline earth metal.

3,854,486

CIGARETTE MAKING MACHINES

Desmond Walter Molins, London, England, and Francis Auguste Maurice, Neuilly-sur-Seine, France, assignors to Molins Limited, London, England

Filed Oct. 27, 1972, Ser. No. 301,567
Claims priority, application Great Britain, Oct. 29, 1971, 50492/71
Int. Cl. A24c *05/52*
U.S. Cl. 131—61 A 34 Claims



1. A cigarette-making machine for making filter-tipped cigarettes, comprising an air-pervious first conveyor; a plurality of studs secured to said conveyor at regular intervals forming between them recesses for receiving tobacco, each stud having a pair of end walls facing in opposite directions and the confronting end walls of adjacent studs being arranged to contain and confine substantially the entire end surfaces of the tobacco sections formed between them in said recesses; means for filling the spaces between successive studs with tobacco; means for compressing the tobacco sections between the studs by a differential air pressure; a second conveyor including suction means for receiving the tobacco sections in spaced relation with recesses therebetween and carrying them towards a continuous wrapper web; means for feeding filter sections into the recesses between successive tobacco sections after the tobacco sections have left the first conveyor; and a rod-forming device for enclosing the tobacco sections and filter sections in a continuous wrapper web to form a continuous rod filled successively with tobacco sections and filter sections.

3,854,487

MANUFACTURE OF FILTER TIPPED CIGARETTE

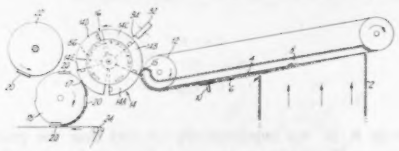
Desmond W. Molins, London, England; Francis A. M. Labbe, Neuilly-sur-Seine, France; Edward G. Preston, and Norman W. Jackson, both of London, England, assignors to Molins Limited, London, England

Filed Oct. 30, 1972, Ser. No. 301,911

Claims priority, application Great Britain, Apr. 27, 1972, 19712/72; Oct. 29, 1971, 50492/71

Int. Cl. A24c *05/52*

U.S. Cl. 131—61 A 5 Claims



1. A cigarette making machine for making filter-tipped cigarettes, including means for forming a continuous tobacco stream on a segmented wheel comprising a plurality of segments which total less than 360° and are movable relatively to one another about the axis of rotation of the wheel; a drive member for said wheel, and a crank member associated with each segment of the wheel, each crank member being pivotally connected to the drive member and having a first arm which carries a cam follower arranged to cooperate with a fixed cam extending around the axis of rotation of the wheel, and a second arm formed with gear teeth which engage with gear teeth on a part connected to the corresponding segment, whereby pivotal movement of the crank member in response to action of said cam and cam follower causes relative movement of the segments by accelerating and decelerating each segment when the wheel is rotated by said drive member, so that the segments are adjacent to one another in one region where the continuous tobacco stream is formed on them, and are spaced apart at a second region so as to form spaced tobacco sections; and means for inserting filter sections into the spaces between successive tobacco sections.

3,854,488

CIGARETTE HOLDER WITH TAR COLLECTING MEANS

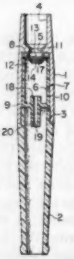
Katsuhisa Terasaki, No. 43 Okimiyacho, Edogawa-ku, Tokyo, Japan

Filed Feb. 13, 1973, Ser. No. 332,155

Claims priority, application Japan, May 2, 1972, 47-51235

Int. Cl. A24f *13/06*

U.S. Cl. 131—210 7 Claims



1. A cigarette holder comprising a cigarette holding member and a mouth piece member, both of said members being removably engaged with respect to each other and defining a smoke passage extending therethrough, and a tar collecting cartridge provided within said smoke passage, said tar collecting cartridge being composed of a substantially cylindrical vessel open at one end and having a substantially restricted opening at the other end thereof and first and second disc members mounted in the open end portion of said vessel to substantially close said open end, said first disc member having at least one small opening adapted to introduce a smoke stream into said cartridge at a high speed by constricting the same, said second disc member being mounted in close proximity to said first disc member and having a portion thereof displaced with respect to the remaining portion toward said other end of the cartridge so as to form two lateral outlet ports at the opposite sides thereof, said displaced portion providing a smoke impinging surface against which the smoke stream constricted by the opening of said first disc member impinges, said outlet ports providing openings through which the smoke stream passes after it has impinged against said displaced portion.

3,854,489

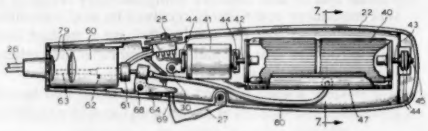
HAIR STYLING APPLIANCE

Edward J. Doyle, Hatboro; Earle Landis, Leola, and Mieczyslaw Saganowski, Lititz, all of Pa., assignors to Schick Incorporated, Lancaster, Pa.

Filed Oct. 12, 1972, Ser. No. 297,019

Int. Cl. A45d *24/00*

U.S. Cl. 132—11 6 Claims



1. A hair styling appliance for simultaneously applying a liquid spray and hot air stream to hair as it is combed or brushed, comprising, in combination:

a housing;

a nozzle for injecting a mist into said hot air stream;

a liquid reservoir;

means comprising a manually actuable liquid pump communicating with said reservoir for drawing liquid therefrom; pump actuator means for actuating said pump;

means comprising a liquid passageway extending between said pump and said nozzle for supplying liquid under pressure to said nozzle; and

means comprising a pressure relief valve disposed within said liquid passageway adjacent the discharge end thereof for inhibiting the flow of said liquid through said passageway when said pump is not being actuated to prevent the unintentional discharge of liquid into said air stream.

3,854,490

AUTOMATIC MONEY DISPENSING MACHINE

Yoshihiro Hatanaka; Hideto Shigemori, and Hisashi Kitagami, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji-shi, Hyogo-ken, Japan

Continuation-in-part of Ser. No. 213,401, Dec. 29, 1971, Pat. No. 3,756,256. This application Sept. 4, 1973, Ser. No. 393,822

Claims priority, application Japan, Dec. 29, 1970, 45-121648; Sept. 30, 1971, 46-75863

Int. Cl. G07d *1/00*

U.S. Cl. 133—4 A 3 Claims

1. An automatic money dispensing machine for dispensing a required amount of money specified by an operator and comprising:

first selector means for selecting said required amount of money to be dispensed and providing a first output signal representative thereof;

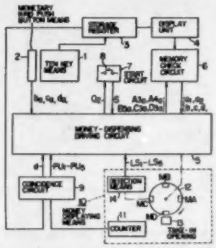
second selector means for selecting a monetary denomination of a particular monetary unit, of which said required

amount of money is to be composed and providing a second output signal representative thereof;

storage means for storing said first output signal and providing a third output signal representative of said required amount of money stored therein;

money issuing control section means operatively responsive to said first output signal and said second output signal and providing control signals representative thereof;

money issuing means operatively responsive to said control signals for issuing money according to said required amount and said specified monetary denomination;



money counting means operatively associated with said money issuing control section means for counting money issued by said money issuing means and providing a fourth output signal representative thereof;

coincidence circuit means operatively associated with said money counting means, said money issuing control section means and said storage means, for comparing said fourth output signal with said first output signal and producing a coincidence signal when said fourth and first signals coincide, said coincidence signal causing said money issuing control section means to stop operation of said money issuing means.

3,854,491

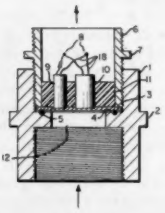
CONTROLLED OPENING, VARIABLE ORIFICE, EXPLOSIVELY ACTUATED VALVE

Paul J. Bryan, Hewitt Post Office, and Ronald F. McConnell, Pompton Lakes, both of N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 3, 1972, Ser. No. 214,839

Int. Cl. B60r *21/08*

U.S. Cl. 137—1 **5 Claims**



1. A valve comprising a body having a passage therethrough which passage provides an inlet and an outlet for fulid under pressure, a fluid-impermeable disphragm closing said passage to the movement of said fluid, a plurality of electrically actuated and explosively operated devices adapted to perforate said diaphragm, means to sequentially activate said devices thereby producing an initial opening of the diaphragm which is smaller than that of the final opening in said diaphragm followed by an enlarged opening to obtain final opening of said diaphragm.

3,854,492

GEAR TYPE FLOW DIVIDER

Yasuo Kita, Kyoto, Japan, assignor to Shimadzu Seisakusho, Ltd., Kyoto, Japan

Continuation of Ser. No. 299,590, Oct. 20, 1972, abandoned, which is a continuation of Ser. No. 59,280, July 29, 1970, abandoned. This application Dec. 28, 1973, Ser. No. 429,325

Claims priority, application Japan, July 31, 1969, 44-73125

Int. Cl. F01c *1/18*

U.S. Cl. 137—99 **7 Claims**

1. A flow divider for dividing an inflow fluid into a plurality of outflow fluids of substantially the same flow rate regardless of the difference in pressure acting on the outflow fluids comprising a casing having a side wall body and end closures, said casing having at one of said end closures both a plurality of fluid inlets and a plurality of fluid outlets, said fluid inlets being adapted to be connected to a single fluid supply line to form a manifold, a gear train located within said casing, said gear train comprising at least three intermeshing rotatable gears, each adjoining pair of which constitute a gear motor and pump structure having a low pressure side and a high pressure side wherein said low pressure side and said high pressure side being communicated to their own corresponding inlet and outlet formed in said one of said end closures of said casing, respectively, for rotation in unison of said intermeshing gears as fluid passes therethrough and wherein one adjoining pair of said intermeshing gears is adapted to function as a motor while the other of said adjoining pair of intermeshing gears functions as a pump in response to a difference in pressure acting on the outflow fluids, said intermeshing gears having their peripheries spaced from the inner wall of said side wall body, gear periphery sealing means for each inlet and outlet side of each adjoining pair of said gears covering the periphery portions of said gears near their meshing areas, said gear periphery sealing means having arcuate concave sealing surfaces corresponding to the addendum circles of said gears and having a running clearance therewith for free and smooth rotation thereof, a pair of thrust plates on the opposite sides of said gear train, each of said thrust plates having peripheral portions for receiving said gear periphery sealing means so that said gear periphery sealing means are maintained in position by bridging it between said two thrust plates, siad peripheral portions being shaped to receive said sealing surfaces in sealing relationship.

3,854,493

VALVE CARTRIDGE

Gerald J. Farrell, Elmhurst, Ill., assignor to Elkay Manufacturing Company, Broadview, Ill.

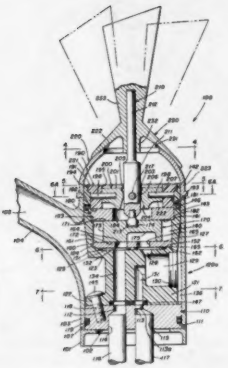
Filed Dec. 11, 1972, Ser. No. 313,824

Int. Cl. F16k *11/06*

U.S. Cl. 137—360 **9 Claims**

1. A valve cartridge for use in a faucet casing defining a cylindrical enclosure receiving said valve cartridge and closed at one end by a base and at the other end receiving an operating handle therethrough and having a water spout extending from the side of the casing and communicating with the enclo-

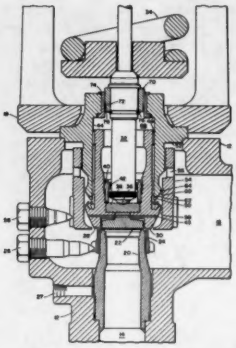
sure therein, at least one water inlet extending through the casing base, said valve cartridge comprising a generally cyindrical housing fitting within the cylindrical enclosure of the associated faucet casing and including a base integral therewith and disposed against the casing base and having a chamber therein, an inlet port in said housing base interconnecting the water inlet in the casing base with said chamber and an outlet port in said housing interconnecting said chamber and the interior of the cylindrical enclosure and the spout of the associated faucet casing, valve means in said chamber for



controlling the quantity of fluid delivered from said inlet port to said outlet port, and an operating handle mounted on said housing for controlling said valve means and extending through the other end of the associated faucet casing to an exposed position for grasping by a user, a recess in the side of said housing adjacent to said housing base and defining therewith flange means disposed on the associated casing base, said flange means having a plurality of openings extending therethrough for receiving fasteners to mount said valve cartridge upon the associated casing base within the associated faucet casing.

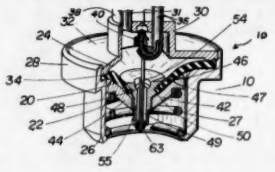
3,854,494
SAFETY VALVE
John Richard Zahorsky, Norwood, Mass., assignor to Crosby Valve & Gage Company, Wrentham, Mass.
Filed Feb. 4, 1974, Ser. No. 439,437
Int. Cl. F16k *17/04*
U.S. Cl. 137—472 **9 Claims**

1. A safety relief valve having, in combination,
a body having inlet and outlet passages, a valve seat communicating with said passages and a sleeve coaxial with the seat, said sleeve having a guide ring forming an axially adjustable extension thereof with a port through the guide ring communicating with the outlet passage, and
a valve head slidable with clearance in the sleeve having a stem slidable relative to said body with a portion in position to close upon said seat, said valve head and sleeve defining a chamber, said sleeve having an outer venturi end surface forming a first passage communicating with



said port and narrowing in the direction from the interior of the guide ring toward the outlet passage.

3,854,495
PRESSURE REGULATOR
John James Cowley, 235 Carmichael Ave., Toronto, Ontario, Canada
Filed May 8, 1972, Ser. No. 250,868
Int. Cl. F16k *31/365*
U.S. Cl. 137—505.44 **4 Claims**



1. Gas flow regulator including:
a casing,
a metal tube having an open end for connection to a high pressure gas source,
said tube ending in a resiliently deformable straight metal extent terminating in said open end,
a seat member defining therein a closed well with an inner bore defined by a metal wall to receive said straight tube portion in said well bore with predetermined clearance; said metal wall being tapered substantially up to said seat to provide that the said predetermined clearance from such tube will be decreasing in the direction approaching said seat,
whereby said resiliently deformable tube and the tapering wall interact to provide a throttling action on gases passing therebetween, and so that such throttling action will increase as said tube open end approaches said seat,
material of lesser hardness than the tube and of lesser hardness than the metal wall located in the base of said well, shaped to form a seat for said tube open end,
means defining a chamber to receive gas originating with said tube and emerging from said well,
a pressure responsive linear actuator responsive to the pressure in said chamber relative to pressure exterior thereto and connected to relatively move said tube open

end away from said seat when said relative pressure in said chamber falls below a predetermined value and to relatively move said tube open end into contact with said seat when said relative pressure in said chamber rises above a predetermined value.

3,854,496

RETURN VALVE

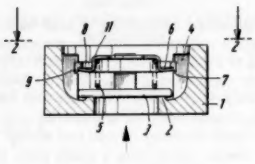
Jurgen Broszeit, Bremen, Germany, assignor to Gustav F. Gerdts KG, Bremen, Germany

Filed Oct. 1, 1973, Ser. No. 402,416

Claims priority, application Germany, Nov. 30, 1972, 22586421

Int. Cl. F16k *15/02*

U.S. Cl. 137—540 **5 Claims**



1. A valve comprising

a housing having a valve seat surrounding an inlet opening;

a valve plate disposed over said opening for coaction with said valve seat;

a plurality of axial ribs on the interior of said housing with each of said ribs having a transverse groove thereacross;

a radially slotted fastening ring yieldably engaging the groove of each of said ribs;

spring means having one end bearing on said valve plate;

a circular abutment plate supporting the opposite end of said spring means and serving as a stop for limiting the movement of said valve plate; and

said abutment plate having a central aperture therethrough and an open slot extending from said aperture to the rim of said abutment plate with substantially the entire circumference of said rim in pressing engagement with the internal cylindrical surface of said ring for firmly mounting said abutment plate in said ring and firmly mounting said ring in said grooves.

3,854,497

COMBINATION SHUT-OFF VALVE AND FLOW CONTROL VALVE WITH SIDE ACCESS AND VIEWING PORT FOR OBSERVATION, TESTING AND ON-LINE SERVICING

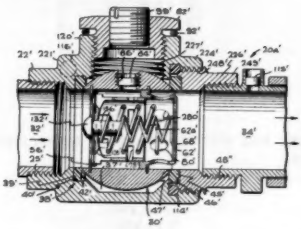
David Rosenberg, Los Angeles, Calif., assignor to Sydney Lampert, Studio City and Herman Wertheimer, Encino, both of, Calif., part interest to each

Filed July 1, 1971, Ser. No. 158,931

Int. Cl. F16k *31/12*

U.S. Cl. 137—557 **15 Claims**

1. Combination shut-off valve and flow-control valve with side access and viewing port for observation and on-line servicing comprising a valve casing having an inlet passage and an outlet passage, a rotatable valve member positioned in said casing between said inlet and outlet passages, said valve member being capable of being turned into different angular positions including a flow-control operating position and shut-off position, said valve member having a bore extending therethrough for permitting liquid flow to occur between said inlet and outlet passages when said valve member is turned into its flow-control position in which said bore communicates with both said inlet and outlet passages, flow-control means in said bore for controlling the liquid flow through said bore, said valve member shutting off both said inlet and outlet passages when said valve member is turned into its shut-off position in which said bore is angularly displaced away from said inlet and outlet passages, said casing having a side access port therein providing access to said valve member, openable closure means normally closing said side access port and capable of being opened for permitting access through said port to said valve member, a window in said valve member permitting observation of said flow-control means in said bore, said window being positioned in alignment with said access port when said valve member is turned into its flow-control position for providing visual inspection of said flow-control means through said side access port while said combination valve remains



on-line in flow-control operation, and said bore being positioned in alignment with said side access port when said valve member is turned into its shut-off position for providing access to said flow-control means through said side access port for servicing said flow-control means while said combination valve remains on-line in its shut-off position, said flow-control means in said bore including plunger means movable downstream in said bore, spring means urging said plunger means in an upstream direction, and said plunger means including visible characteristics on its side such as scribed lines, graduations, side openings or the like which are observable through said window for visually determining the operating position of said plunger means.

3,854,498

GAS SUPPLYING APPARATUS

Emil Uecker, Hamburg, Germany, assignor to Albert Hoffmann, Westrhauderfeh and Hans Spechtmeyer, Leer, both of, Germany

Filed July 9, 1973, Ser. No. 377,354

Claims priority, application Germany, July 25, 1972, 2236404

Int. Cl. F16k *47/00*

U.S. Cl. 137—544 **14 Claims**

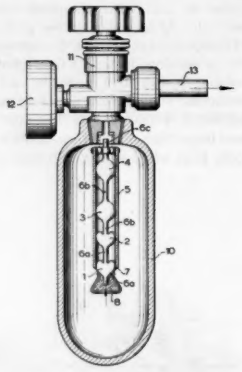
1. A medical (An) apparatus for supplying gas at a reduced pressure from (a) an oxygen bottle pressure vessel containing a pressureized gas and having an outlet valve fitted thereon comprising:

an oxygen bottle;

a plurality of nozzle means arranged in said oxygen bottle; and

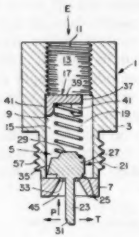
a plurality of stacked spaced-apart chamber means communicating with and disposed so as to be alternately supported between said plurality of nozzle means, one of said plurality of nozzle means being an inlet nozzle communicating with the gas under pressure in said oxygen bottle and another of said plurality of nozzle means being an outlet nozzle communicating with (the) said outlet valve

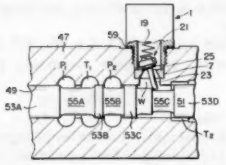
to thereby provide an expansion path for the gas from the inlet to the outlet nozzle as it proceeds alternately



through said plurality of nozzle means and chamber means.

3,854,499
VALVE
Donald A. Sievenpiper, Kalamazoo, Mich., assignor to General Signal Corporation, Rochester, N.Y.
Filed Mar. 26, 1973, Ser. No. 344,653
Int. Cl. F16k *11/00*
U.S. Cl. 137—596.2 **12 Claims**





1. In a hydraulic system comprising a control valve including a core member having a bore which slidably retains a spool means through or about which hydraulic fluid is capable of controlled flow by reciprocation of the spool in the bore, at least one fluid input port, tank port, and work port, said ports being in the walls of said bore and communicating with said spool, and a check valve located within said work port,

said check valve comprising a housing member, a valve mechanism, and a valve seat,

said housing member comprising walls which define a fluid path, said valve mechanism being located in said path,

said valve mechanism comprising a spring means, a spring retaining member, a sealing means, and a stem means for tilting said sealing means, said sealing means being free to move in a first direction of flow through said valve against the bias of said spring means,

said valve seat being positioned against flow in said housing member path, and said spring means normally biasing said sealing means into sealing engagement with said valve seat,

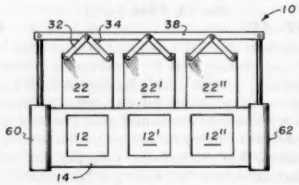
said housing member path comprising a relatively large valve mechanism retaining chamber and a relatively smaller orifice, said spring retaining member being located at the point of communication of said retaining chamber and said smaller orifice, said spring means being a coil spring, one end of which contacts said spring retaining member while the other end contacts said sealing means,

said sealing means comprising a seat member, a guide means, and a coil spring centering means, said seat member being of a diameter larger than said valve seat orifice, said guide means being of a diameter only slightly less than the diameter of said chamber and said coil spring centering means being of a diameter only slightly less than the inner diameter of said coil spring,

said guide means comprising a guide plate of a crosssectional shape different from that of said retaining chamber, said other end of said coil spring contacting the guide plate said seat member being located on said guide plate and in flow intercepting communication with said valve seat orifice, and said spring centering means being located on said guide plate and extending into the cone defined by said coil spring a distance sufficient to retain said spring in its centrist position when said sealing means is tilted,

said spool including at least one groove located in flow communication with said work port, and at least one land adjacent said groove, said stem means extending through an orifice in said valve seat a sufficient distance such that when said spool is reciprocated so as to isolate said work port from said input port and bring said groove into flow communication with said tank port, said land moves said stem in a direction substantially perpendicular to flow through the check valve thereby tilting said sealing means so as to place said check valve in flow communication with said tank port.

3,854,500
GATE VALVE
Thomas H. Cooper, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Dec. 29, 1972, Ser. No. 319,592
Int. Cl. F16k *3/30*
U.S. Cl. 137—601 **1 Claim**



1. A gate valve for controlling flow of fluid under pressure comprising:

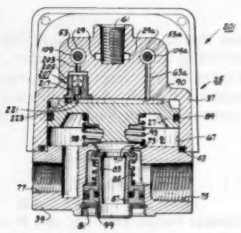
a. a plurality of gates arranged in parallel;

b. a plurality of valve bodies for receiving said gates;
c. means on said valve bodies for providing a labyrinth seal between said gates and said valve bodies;
d. means for moving said multiparallel gates in their planes between and across said labyrinth seal means for valve closing and opening;
e. means pivotally interconnecting said gates and said moving means at one point for each gate, said point for each gate lying along a line passing through an individual gate's center of mass parallel to the direction of movement of said gate, for transferring the force generated by said valve opening and closing means to said gates; and
f. fluid support means positioned at the downstream side of said gates for reducing sliding friction between said gate and said valve body when opening and closing said gates by lifting said gates against said fluid pressure.

3,854,501
ANTILOCK BRAKE SYSTEM AND CONTROL VALVE THEREFOR

John A. Machek, Creve Coeur, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed June 14, 1973, Ser. No. 369,966
Int. Cl. B60t *8/12*
U.S. Cl. 137—627.5 **46 Claims**



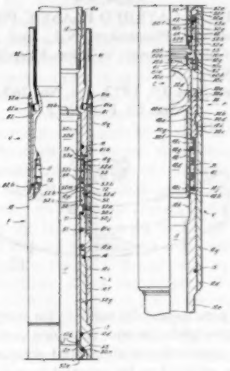
1. A control valve for an antilock brake system comprising a housing, means movable in said housing in response to control fluid pressure applied thereto between an inoperative position and an operative position for effecting the application through said housing of fluid pressure supplied thereto; and other means movable in said housing to a position predeterminately restricting the applied flow of control fluid pressure to said first named means upon movement thereof to its operative position, said other means comprises means for engagement with said first named means in its inoperative position thereby to urge said other means to a substantially nonrestricting position in said housing.

3,854,502
METHOD AND APPARATUS FOR AN EQUALIZING VALVE

James D. Mott, Houston, Tex., assignor to Hydril Company, Houston, Tex.

Continuation of Ser. No. 214,685, Jan. 3, 1972, abandoned. This application July 23, 1973, Ser. No. 381,481
Int. Cl. F16k *11/16*
U.S. Cl. 137—629 **13 Claims**

1. A subsurface safety valve adapted for mounting with a well conduit for controlling flow of fluid through the well conduit at a subsurface location in the well including:
a. a flow housing having a bore therethrough communicating with a flow passage of the well conduit above and below the safety valve;
b. bore closure means mounted with said flow housing for movement to and from an open position for enabling flow of fluid through the flow passage and a closed position for blocking flow of fluid through the flow passage of the well conduit;
c. means with said flow housing for effecting operating movement of said bore closure means to and from the open and closed positions, said means for effecting movement moving said bore closure means to the open position in response to a first control signal communicated from the surface through a first control means;
d. fluid pressure equalizing means for enabling desired fluid communication about said bore closure means when said

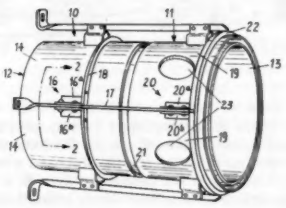


bore closure means is in the closed position to substantially balance the urging of the fluid pressure on said bore closure means; and
e. means for operating said fluid pressure equalizing means to equalize the fluid pressure about said bore closure means in response to a second control signal communicated to said flow housing from the surface through a second control means independent of the well conduit and said first control means wherein fluid pressure urging on said bore closure means may be equalized.

3,854,503
FLAME TUBES

Tom Worsley Nelson, Crawshawbooth; Gordon Sedgwick, Nelson, and Roy Lindop, Bolton, all of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Aug. 5, 1971, Ser. No. 169,449
Int. Cl. F15d *1/00;* **F23d** *15/02*
U.S. Cl. 138—37 **23 Claims**



1. A flame tube for a gas turbine engine, comprising a first tube member of ceramic material having openings at both ends, one of the said openings forming an inlet for the flame tube, a baffle within the inlet and adapted to direct air enter-

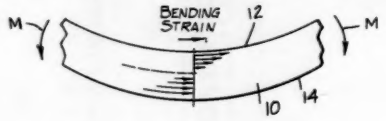
ing the inlet against the wall of the first tube member, an axially aligned second tube member spaced from the end of the first tube member remote from the said inlet and having at its end remote from the inlet an opening which forms the flame tube outlet, a plurality of passages for air in the wall of the second tube member, and clamping means engaging both of the tube members to maintain them in aligned spaced relationship, the said clamping means permitting differential thermal expansion between the clamping means and the tube members.

3,854,504

MULTI-LAYERED PLASTIC PIPE

Robert S. Morrison, Piscataway, N.J., and Jack E. Hesse, Englewood, Colo., assignors to Johns-Manville Corporation, New York, N.Y.

Filed June 15, 1972, Ser. No. 263,323
Int. Cl. F16l *9/12*
U.S. Cl. 138—141 **7 Claims**



1. A plastic pipe especially suitable for carrying acidic and alkaline solutions underground, said pipe comprising:

a. an inner circumferential layered section including organic yarn adapted to be exposed to said solutions;

b. an outer circumferential layered section including glass fibers; and

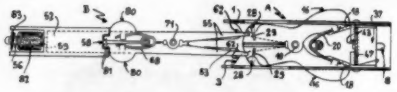
c. a circumferential protective barrier including reinforced organic laminate positioned between and separately bonded to said inner and outer circumferential layers, said barrier being approximately located at points of minimum bending strain along the cross-section of the pipe so as to minimize the possibility of crazing to the barrier by said bending strain.

3,854,505

SHUTTLELESS LOOM GRIPPERS

Jean Duplessy, "Le Sommet", 5 bis, rue J. B. Simon, Sainte-Foy Les-Lyon, France

Filed Apr. 27, 1973, Ser. No. 355,008
Claims priority, application France, Apr. 27, 1972, 72.15999
Int. Cl. D03d *47/20*
U.S. Cl. 139—122 **8 Claims**



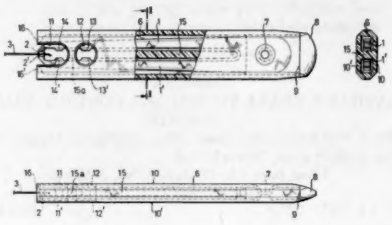
1. In a loom on which the insertion of weft threads into successive sheds is accomplished by two gripper rapiers, a feed gripper A and a take-off gripper B which, starting from opposite sides, meet in the middle of a shed where the feed gripper A transmits to the take-off gripper B, a weft thread which it has drawn from a fixed supply located on one side of the loom, and characterized in that the grippers penetrate each other when they meet in the middle of the shed; each gripper being provided with a cooperating means (**29, 62**) which while said grippers are in the prolongation of each other act to mutually interlock at the beginning of the return run of said grippers so as to ensure the alignment thereof; to open gripper A to release the weft thread, and to close gripper B on to the same weft thread, said actions being brought about by the opposite pull of said grippers.

3,854,506

GRIPPER SHUTTLE

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed May 23, 1973, Ser. No. 363,151
Claims priority, application Switzerland, May 26, 1972, 7814/72
Int. Cl. D03j *5/06*
U.S. Cl. 139—125 **10 Claims**



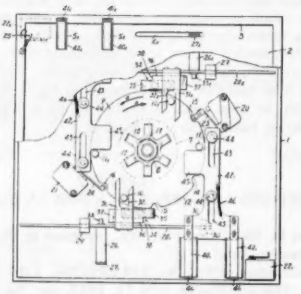
1. A gripper shuttle for picking weft yarns in a weaving machine comprising a housing, a gripper clamp mounted within said housing having means for gripping a weft yarn, and a stay-like longitudinal partition extending within said housing over at least some of the length of said housing for reinforcing said housing.

3,854,507

FRACTION DISPENSER

Masanari Nishioka; Fumio Tomatsu, and Ryuzoo Fukami, all of Osaka, Japan, assignors to Kabushiki Kaisha Toyo Seisakusho, Osaka, Japan

Filed Aug. 3, 1972, Ser. No. 277,785
Claims priority, application Japan, Aug. 4, 1971, 46-58800
Int. Cl. B65b *43/56*
U.S. Cl. 141—130 **8 Claims**



1. A fraction dispenser comprising:

1. a plurality of receptacles supported in a plurality of racks;

2. means for dispensing samples into said receptacles as they are individually positioned under said dispensing means; and

3. means for shifting said plurality of racks in lateral and longitudinal directions to position said racks with respect to said dispensing means so that the receptacles of respective racks are sequentially individually positioned under said dispensing means, said shifting means comprising:

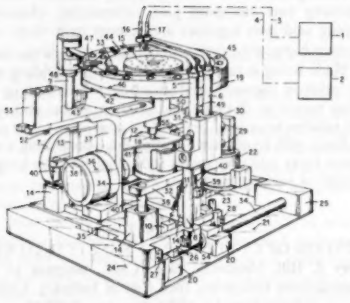
a. driving means;
b. a cam having projection means thereon and rotatably connected to said driving means;
c. first means operative to be selectively engaged by said projection means and operative in response to rotation of said cam to shift said racks in the longitudinal direction;
d. second means operative to be selectively engaged by said projection means and operative in response to rotation of said cam to shift said racks in the lateral direction; and
e. means associated with said cam, and driving, first and second means operative to control rotation of said cam to selectively engage said first and second means.

3,854,508

AUTOMATED SAMPLE-REAGENT LOADER

Carl A. Burtis, Knoxville; Wayne F. Johnson, Loudon, and William A. Walker, Knoxville, all of Tenn., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Apr. 13, 1973, Ser. No. 350,860
Int. Cl. B65b *43/60*; **G01n** *1/10*
U.S. Cl. 141—130 **4 Claims**



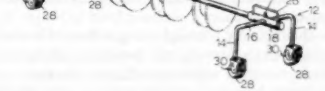
1. An automatic loader for loading a photometer analyzer rotor provided with a plurality of cavities, comprising a rotor table for holding said rotor at the center thereof during a loading operation; an inner ring provided with a plurality of holes for receiving and holding a plurality of respective reagent cups, said ring adapted to be positioned on said table and encompassing said rotor; an outer ring provided with a plurality of holes for receiving and holding a plurality of respective sample cups, said outer ring adapted to be positioned on said table encompassing said inner ring such that respective pairs of said reagent cups and sample cups are in radial alignment with corresponding cavities in said rotor; a base plate; a pair of horizontal slide rods mounted on said plate; a rotor table support mechanism slidably mounted on said slide rods; a first pipette support member affixed to said base plate; a second pipette support member slidably supported by said first support member to provide slight relative motion therebetween; an off-center spring mounted between said second pipette support and said support mechanism to effect said slight motion when said support mechanism is moved from one limit position to another limit position; four vertical slide rods mounted on said support mechanism, each of said vertical slide rods being spaced apart each from the other at a given distance; respective slide members encompassing respective ones of said vertical rods; a respective horizontal bracket member extending between and affixed to respective pairs of said slide members; an L-shaped bracket having a vertical portion and a horizontal portion and being affixed to one of said bracket members; a vertical motion synchronous motor affixed to the vertical portion of said L-shaped bracket, the horizontal portion of said L-shaped bracket supporting said rotor table on the top thereof, a first crank arm coupled between said vertical motion motor and said support mechanism; a first pair of limit switches mounted on said support mechanism for sensing the limits of vertical travel of said L-shaped bracket and rotor table; a synchronous table motor mounted beneath the horizontal portion of said L-shaped bracket and supported thereby and being coupled to said rotor table; a horizontal motion synchronous motor mounted on said base plate; a second crank arm coupled between said horizontal motion motor and said slidable support mechanism; a second pair of limit switches mounted on said first pipette support member for sensing the limits of horizontal travel of said table support mechanism; a plurality of indexing notches provided in the underside of said rotor table; an indexing switch for sequentially engaging each of said notches during said loading operation; a pair of automatic pipettes provided with respective tips and coupled to respective ones of said pipette supports; electrical control means mounted on said base plate connected to and controlling said vertical motion motor, said synchronous table motor, said horizontal motion motor, and said automatic pipettes; said control means being provided with a RUN/RESET switch and a START switch, whereby said control means under control of said switches is adapted to effect the bringing of the table and one of said sample cups and one of said reagent cups underneath the pipette tips, effect the bringing of said cups to said tips by upward table movement, effect the drawing of liquids from said cups by said automatic pipettes, effect the bringing of said cups and table down, effect the movement of the table horizontally over to bring the rotor cavities under said tips followed by an upward movement of said table to bring said cavities to said tips, and effect the dispensing of said drawn liquids into said cavities by said automatic pipettes after which said table is brought down, effect the rotating of said table to its next indexed position and sequentially effecting a repetition of the above procedure until all of the rotor cavities are filled.

3,854,509

MOBILE REEL SUPPORT UNIT

Richard L. Bailey, R.D. No. 3, Spring Grove, Pa. 17362

Filed Nov. 30, 1973, Ser. No. 420,395
Int. Cl. B65h *75/40*
U.S. Cl. 242—86.5 R **2 Claims**



1. A mobile reel support unit designed to accommodate a plurality of reels in an elevated horizontal configuration so that materials packaged upon said reels may be manually or mechanically dispensed therefrom, said support unit comprising in combination, a longitudinal axle member of uniform geometrical cross-sectional configuration having opposite end portions slidably assembled within an upright standard member at either end thereof, said standard members being similar and U-shaped and the legs thereof extending downwardly to form vertically extending support members, a horizontal sleeve rigidly connected to the upper horizontal portions of said U-shaped supports and extending in opposite directions therefrom transversely to the planes thereof, said sleeves having a cross-sectional shape closely complementary to that of said axle member and slidably adjustably receiving end portions of said axle member, a caster assembly attached to

the lower end of each of said support members of said standard members, said sleeves of said standard members each having a thumb screw to connectably engage said axle member to position said standard member at desired positions upon said axle member, each of said standard members further having a U-shaped handle assembly connected to and extending upwardly from the upper portions thereof to facilitate movement of said support unit, said thumb screws extending upwardly between the legs of said U-shaped handles to prevent accidentally loosening the screws.

3,854,510

TREE FELLING DEVICE

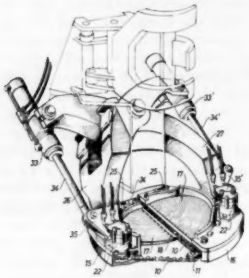
August Matlik, Gavle, Sweden, assignor to Brundell och Jonsson AB, Gavle, Sweden

Filed June 1, 1973, Ser. No. 366,018

Claims priority, application Sweden, June 19, 1972, 8067/72

Int. Cl. A01g *23/08*

U.S. Cl. 144—34 R **4 Claims**



1. A tree felling device adapted to be operated when suspended from a crane beam and comprising:

at least one arcuate frame member pivotally mounted about a single pivot shaft;

an endless saw chain journalled about a plurality of sprockets in a plane in each said at least one frame member;

means associated with one of said sprockets for rotating said one sprocket and for thereby rotating said saw chain in an operative direction;

said saw chain having a straight length thereof between two of said sprockets forming an operative part for cutting;

a saw blade mounted within said frame member;

said saw blade having a straight guiding edge portion extending between ends of said frame member and having therein a straight groove, said operative part of said saw chain being slidingly guided within said groove, at least said guiding edge portion of said saw blade having a thickness at least as great as the largest cross sectional shape of said saw chain, said guide edge portion of said blade thus forming means for supporting a tree during cutting and preventing said tree section from clamping downwardly on said operative part of said saw chain;

said pivot shaft being located outside said saw chain and having an axis inclined at an angle of from 0°–60° to the principal direction of movement of said operative part of said saw chain; and

the cross sectional shape of said saw blade, formed by any plane perpendicular to said pivot shaft, being an arc with a radius substantially corresponding to the perpendicular distance from said pivot shaft.

3,854,511

BLADE HOLDER FOR STEEL STRIP BLADES

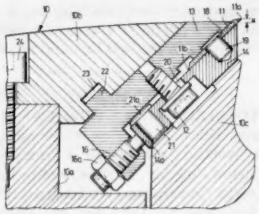
Gerhard Maier, Brackwede, Germany, assignor to Maschinenfabrik B. Maier KG, Brackwede, Germany

Filed Apr. 12, 1973, Ser. No. 350,491

Claims priority, application Germany, Apr. 24, 1972, 2220003

Int. Cl. B27g *13/00;* **B26d** *1/12*

U.S. Cl. 144—230 **10 Claims**



1. A steel strip blade holder which is detachably locatable in a cutting head of a wood chipping machine, said holder comprising two clamping jaws, connecting elements for clamping said jaws together and a steel strip blade clamped and interchangeably retained between said jaws, said steel strip blade being detachably connected to a holding means in fixed relation thereto; and adjusting means acting on said holding means to displace said holding means and said strip blade relative to at least one of said jaws so as to set said steel strip blade with its effective cutting edge projecting a required distance from said one jaw at right angles to the longitudinal direction of said cutting edge.

3,854,512

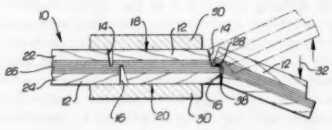
METHOD OF CUTTING FLAT SHEETS INTO STRIPS

Harvey J. Hill, Monterey Park, Calif., assignor to Roberts Consolidated Industries, Inc., City of Industry, Calif.

Filed June 11, 1973, Ser. No. 368,740

Int. Cl. B27c *9/00*

U.S. Cl. 144—326 R **5 Claims**



1. A method of cutting into strips a flat sheet having spaced, paralle, first and second sides, including the steps of:

a. sawing in the first side of the sheet parallel first grooves which are uniformly spaced apart in a direction parallel to the planes of the sides of the sheet;

b. sawing in the second side of the sheet parallel second grooves which are uniformly spaced apart in said direction the same distance as said first grooves, and which are paired with and are slightly spaced from said first grooves, respectively, in said direction to provide pairs of slightly offset first and second grooves, the combined depths of said first and second grooves of each pair being at least equal to the thickness of the sheet, thereby dividing the sheet into strips of the same width breakable from each other in zones respectively interconnecting said first and second grooves of said pairs; and

c. breaking each of said strips from the adjacent strip by applying adjacent the free edge of the strip to be broken off a force generally perpendicular to the planes of the

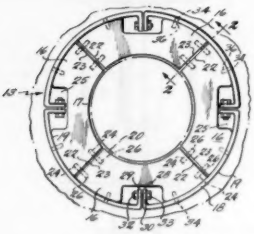
sides of the sheet and acting along the entire length of said free edge.

3,854,513

INTERNAL WHEEL SAFETY DEVICE FOR VEHICLES

Valsin J. Buttone, 8445 Fairfax Dr., Chalmette, La. 70043, and Larry J. Buttone, 4428 Reich St., Metairie, La. 70002

Filed Oct. 17, 1973, Ser. No. 407,057
Int. Cl. B60c *17/04*
U.S. Cl. 152—158 **6 Claims**



1. For use with a vehicle wheel rim and tire, a safety device mounting within said tire comprising:

a. at least two arcuate spacer segments; each of said spacer segments having two oppositely disposed ends, an inner and outer periphery and a recess opening located along the outer periphery intermediate of said ends; said spacer segments being placed end to end to extend in a common plane and having said inner peripheries adapted to be disposed against said rim;

b. at least two arcuate band members, each of said band members having two oppositely disposed ends, each of said band member ends having a portion extending radially inwardly; said band members being placed end to end around the outer peripheries of said spacer segments with said radially inwardly extending portions being disposed in said recesses;

c. fastening means disposed parallel to the plane of said segments and adapted to secure said portions of said band members together;

d. pin means for securing said spacer segment ends together; and

e. additional pin means for securing said steel band segments to said spacer segments so that when said fastening means are secured, said band members will be disposed against said spacer segments, resulting in a tight frictional fit of said spacer segments against said rim.

3,854,514

TIRE CHAIN CARRIERS

Ralph R. Edwards, 1 Haymount Ter., Briar Cliff Manor, N.Y.

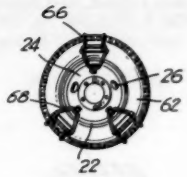
Filed Nov. 16, 1972, Ser. No. 307,238
Int. Cl. B60c *27/02*
U.S. Cl. 152—233 **12 Claims**

1. A snow chain carrier for a vehicle wheel, the vehicle wheel being of the type having a bowl-shaped body portion, the bowl having hand holes spaced at regular intervals thereabout, said chain carrier comprising:

a. hook engaging means adapted for:
extending across at least a portion of one of the hand holes on one side of the bowl, and
engaging the hook end of a snow chain;

b. strap engaging means adapted for:
extending across at least a portion of the hand hold on the opposed side of the bowl, and
engaging the strap end of snow chains; and

c. securing means adapted for:



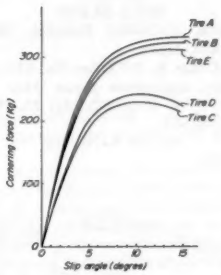
extending through the hand hole, and
rigidly securing said hook engaging means and strap engaging means to opposed sides of the bowl.

3,854,515

RADIAL TIRE HAVING POLYESTER CORD BREAKER

Satoshi Takemura; Mitsuaki Maeda, and Noboru Sakai, all of Tokyo, Japan, assignors to Bridgeton Tire Company Limited, Tokyo, Japan

Filed June 22, 1973, Ser. No. 372,573
Claims priority, application Japan, June 28, 1972, 47-64638
Int. Cl. B60c *9/18;* **D02g** *3/48*
U.S. Cl. 152—361 R **4 Claims**



1. In a radial tire having a tread portion, a pair of side portions extended to the tread portion at both the shoulders thereof, a pair of bead portions formed in the inner peripheries of the side portions respectively, a breaker formed inside the tread portion along its peripheral direction, and a carcass, the improvement characterized by:

a. the breaker comprising adhesive treated, heat set polyester cords formed of twisted yarns,

b. each yarn comprising a bundle of a plurality of filaments consisting of polyester having a low polymerization degree and an intrinsic viscosity of 0.3–0.8 measured in o-chlorophenol at 25°C,

c. the twisting being performed at a twisting coefficient (N_T) of 0.15–0.45, said twisting coefficient being expressed by the following formula:

$$N_T = N \times \quad 0.139 \times D/\rho \times 10^{-3}$$

wherein N is the number of cable twists per 10 cm of cord, D is one-half of the total deniers of cord, and ρ is the density of fiber,

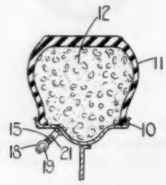
d. the cords being treated with an adhesive to implement their adherance to rubber, and

e. the heat setting being performed at a temperature of 230°–255°C for 2–4 minutes under a tension of 0.15–1.0 g/denier.

3,854,516
VEHICLE WHEELS

Hughie Burnell, West Bromwich, England, assignor to Archibald Kenrick & Sons Limited, West Brunswick, England

Filed May 9, 1973, Ser. No. 358,632
Claims priority, application Great Britain, May 12, 1972, 22537/72
Int. Cl. B60c *23/00*
U.S. Cl. 152—415 **5 Claims**

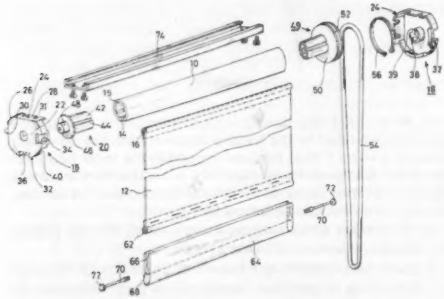


1. A method of filling a tire on a vehicle wheel comprising fitting the tire to a rim of the wheel, injecting through an inlet opening in the rim, liquid ingredient materials to create a polyurethane foam filling for the interior of the tire, closing said inlet opening, revolving the wheel about a vertical axis to distribute said ingredients around the interior of the tire and when foam begins to escape through an outlet at a position on the rim diametrically opposite the inlet opening, closing a shut off valve at said outlet to prevent escape of further foam.

3,854,517
ROLL BLIND

Isamu Nakamura, 12-24-403 5-chome, Minami-Aoyama, Minatoku, Tokyo, Japan

Filed Mar. 8, 1973, Ser. No. 339,285
Claims priority, application Japan, May 17, 1972, 47-57761; May 23, 1972, 47-60382; May 23, 1972, 47-60383; July 7, 1972, 47-80363
Int. Cl. A47h *1/10*
U.S. Cl. 160—323 **4 Claims**

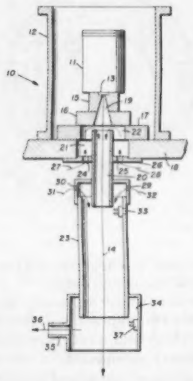


1. A blind which comprises a rotary hollow tube for supending and winding an element about the hollow tube, a pair of fixing means fixably mountable to wall means of a room for supporting said hollow tube, coupling means for rotatably connecting said hollow tube to one of the pair of fixing means, pulley means for rotatably connecting said hollow tube to the other of the pair of fixing means, each of the pair of fixing means including (a) a disc portion having at its periphery an inwardly projecting square rim comprising a straight and a curved portion respectively provided with (b) at least two recesses and two openings, said openings being positioned in symmetrical opposed relation to said straight portions of the square rim, and (c) a horseshoe shaped bearing provided, at the center of the disc, with an access opening adapted to receive shaft portions respectively provided on said coupling and pulley means.

3,854,518
MELT EXTRUSION METHOD FOR PRODUCING WIRE FROM STEEL ALLOYS

Bernhard T. Junker, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1973, Ser. No. 429,333
Int. Cl. B22d *11/12*
U.S. Cl. 164—66 **4 Claims**



1. In the method for forming fine diameter wire directly from the melt of an alloy of steel by extruding said melt as a free-streaming molten jet into an oxygen-containing medium to form a stabilizing film about the peripheral surface of the jet and thereafter cooling the film stabilized molten jet to produce a solid wire product, the improvement which comprises effecting said cooling by:

a. leading said film stabilized molten jet through a first cooling zone in which gaseous hydrogen is continuously admitted into the entrance thereof at a predetermined flow rate, the direction of said hydrogen flow being cocurrent with that of said molten jet;

b. causing the jet together with said hydrogen flow to enter a second cooling zone being provided with a continuous supply of air introduced proximate to the entrance thereof at a predetermined rate of flow, the direction of said air flow being co-current with that of said jet and said hydrogen whereby a combustible gas mixture of air and hydrogen is caused to form;

c. igniting said combustible gas mixture to cause combustion thereof; and

d. exhausting the products of said combustion at the terminal end of said second cooling zone while continuously forwarding the resulting solidified wire product to a take-up device.

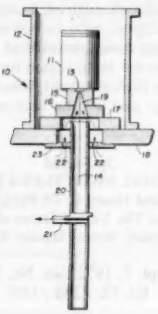
3,854,519
APPARATUS FOR STARTING EXTRUSION OF FILAMENTS FROM METALLIC MELTS

Bernhard T. Junker, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 28, 1973, Ser. No. 429,331
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 **1 Claim**

1. In an apparatus for forming continuous filaments directly from the melt of a metal, wherein under a positive head pressure the melt is ejected through an orifice and into a discharge cavity as a molten metal stream from whence the stream

descends in a downward vertical path through a cooling column positioned immediately beneath said discharge cavity, the improvement which comprises means for controlling the



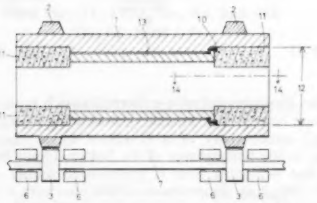
pressure level across the orifice, said means comprising: a slide valve positioned in said cooling column downstream from said discharge cavity and means for introducing a pressurizing gas into said discharge cavity.

3,854,520

VIBRATION-PREVENTIVE CENTRIFUGAL CASTING APPARATUS

Reizo Yokota, Osaka, Japan, assignor to Yodogawa Steel Works, Ltd., Osaka-shi, Osaka-fu, Japan

Filed Oct. 30, 1972, Ser. No. 302,000
Int. Cl. B22d *13/02*
U.S. Cl. 164—291 **2 Claims**



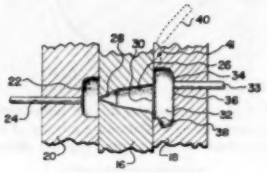
1. A vibrationless centrifugal casting apparatus comprising:
a mold shell adapted to be rotated for centrifugal casting said shell having a raised central section at its inner surface forming shoulders on the inner surface at each end of said central section;
a cylindrical metallic liner fitted in said mold shell, said liner having an outer surface spaced a minute distance from the inner wall of said mold shell when fitted therein and said outer surface having an uneven configuration which will provide discontinuous contact with the inner wall of said mold shell when said liner is thermally expanded, said liner having a flange portion at one end thereof and said flange being secured to one shoulder of the central section of said mold shell; and
a pair of sand molds mounted within said mold shell and abutting each end of said liner.

3,854,521

SELF CONTAINED METAL CASTING DIES

Karl Hannes, White Plains, N.Y., assignor to Coats & Clark, Inc., New York, N.Y.

Filed July 25, 1972, Ser. No. 274,910
Int. Cl. B22d *1/00*
U.S. Cl. 164—347 **8 Claims**



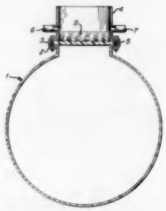
1. Die casting apparatus having a plurality of die plates for forming a metal cast part and attached gate part therein comprising
a first outer die plate having a first recess in which said cast part is formed by injecting molten metal therein;
a second die plate positionable in abutment with said first die plate during casting and having an opening therethrough in communication with said first recess to permit said molten metal to flow through said opening into said first recess;
said second die plate being mounted in a substantially fixed position within said apparatus, and said first die plate being movable with respect thereto;
a third outer die plate having a second recess therein, said second recess and said opening in communication with each other when said second and third plates are in abutment and adapted to form the gate part when the molten metal is injected therein, said third plate being in abutment with said second plate during casting and being movable relative thereto,
said second recess being open at the surface of said third die plate and including at one end a portion which extends beyond the area of the recess open at the surface of the third die plate and thus constitutes an undercut portion of said third die plate, said undercut portion including a convex surface extending inwardly from the surface of the third die plate and terminating at a concave surface portion of said third die plate within said second recess, said convex and concave surface portions being shaped to permit removal of said gate part only by pivotal movement about said convex surface portion; and
means mounted on said first and third plates for ejecting said cast part and said gate part respectively from said die plates.

3,854,522

HIGH SERVICE TEMPERATURE PRESSURE SENSITIVE DEVICE

William J. Didycz, Whitehall Borough, and Almon D. Seabury, Hampton Twp., Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 133,938, April 14, 1971, Pat. No. 3,780,793. This application Apr. 25, 1973, Ser. No. 354,609
Int. Cl. F24h *13/00*
U.S. Cl. 165—1 3 Claims



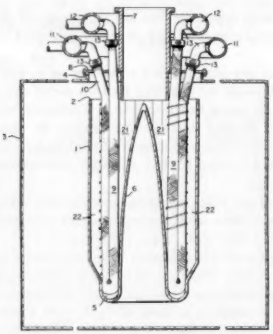
1. A method of increasing the service temperature of vented rupture discs comprising maintaining a body of cooling liquid on the outer surface of said vented rupture disc.

3,854,523

LIQUID HEAT EXCHANGE SYSTEM

Frank T. Smith, and Robert D. Smith, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 173,108, Aug. 19, 1971, , and a continuation-in-part of Ser. No. 63,851, Aug. 14, 1970, abandoned. This application May 4, 1973, Ser. No. 357,078
Int. Cl. F28d *7/00*
U.S. Cl. 165—1 7 Claims



1. An apparatus for accomplishing heat exchange between a flowing first liquid and a second liquid having a temperature significantly different from that of the first liquid which comprises

a. a tank having an input means for receiving the flowing first liquid and an output means by which the flowing first liquid exits,

b. a plurality of tube bundles each of which comprises a plurality of small diameter flexible tubes made from an organic polymer composition, one end of each of which bundles is coupled to an inlet means while the other end is coupled to an outlet means to permit the flow of the second liquid through the interior of the tubes, each tube bundle being disposed within and extending substantially from the top to the bottom of the tank and in relationship to the input and output means of the tank such that a substantially unbroken annular heat exchange region is provided and the tank is divided into an input side and an output side,

c. means for directing the passage of a substantially uniform volume of the first liquid from the input side to the output side of the tank and through each unit area of the annular heat exchange region,

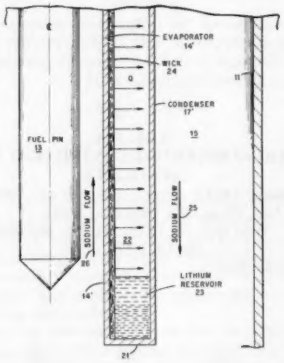
d. particle trapping means, located at the bottom of said tank adjacent to the input region for receiving and containing particles carried by said flowing first liquid before it passes through said annular heat exchange region.

3,854,524

THERMAL SWITCH-HEAT PIPE

Keith E. Gregorie, and Henry C. Pfefferlen, both of San Jose, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Sept. 7, 1972, Ser. No. 287,211
Int. Cl. F28d *15/00*
U.S. Cl. 165—32 4 Claims

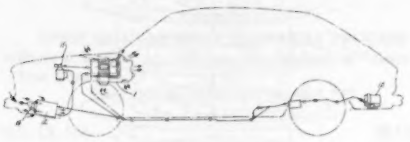


1. An apparatus defining a thermal switch positioned about a nuclear heat source capable of producing a large change in thermal conductivity of a structure by a relatively small change in the temperature of the hotter side of the structure such that negligible heat is transported during a predetermined operating temperature of the structure while a large amount of heat is transported during a temperature excursion comprising: vertically positioned annular evaporator means defining a first wall member, annular condenser means positioned externally of and in vertical spaced relationship with respect to said evaporator means and defining a second wall member, means defining a third member interconnecting one end of said wall member of said evaporator means and one end of said wall member of said condenser means defining an annular chamber therebetween and forming an annular reservoir for working fluid at the lower end portion thereof, wick means located within said chamber and said reservoir and secured only to said wall member of said evaporator means, said wick means being selected from the group consisting of a plurality of layers of fine mesh screen and a layer of powdered stainless steel bonded to said wall member of said evaporator means, and a quantity of working fluid retained in said reservoir and in contact with a portion of said wick means, said working fluid being selected from the group consisting of lithium and sodium and of the type capable of climbing by capillary action and wetting said wick means.

3,854,525
AIR CONDITIONING PLANT, PARTICULARLY FOR MOTOR VEHICLES

Manfred Illg, Aldingen, Germany, assignor to Firma Suddeutsche Kuhlerfabrik Julius Fr. Behr, Stuttgart-Feuerbach, Germany

Continuation-in-part of Ser. No. 18,528, March 11, 1970, abandoned. This application Mar. 7, 1973, Ser. No. 339,028
Claims priority, application Germany, Mar. 12, 1969, 1912607
Int. Cl. B40h *3/00*
U.S. Cl. 165—42 **4 Claims**

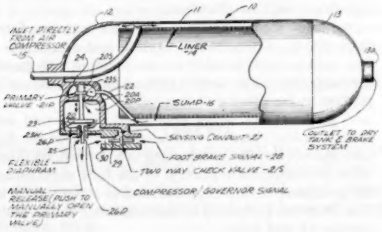


1. In an air conditioning plant for motor vehicles comprising, a housing having an air suction chamber, a heat exchanger, a refrigerating plant having a condenser, an evaporator, a blower motor and blower means, the improvement where said blower means is a double radial blower disposed in a housing, said blower motor is disposed between said radial blowers, said air suction chamber is disposed between said two blowers and a fresh air and an ambient air channel are provided in said housing on opposite sides thereof in proximity to said blower means, a slidable closure movable relative to said fresh air and said ambient air channels, said slidable closure being a flexible band disposed along the outer edges of said suction chamber, and means operative to slide said closure into different positions to admit fresh air, ambient air or a mixture of both.

3,854,526
TANK

Robert R. Cole, Yorba Linda, and Raymond S. Bullard, La Palma, both of Calif., assignors to Royal Industries, Inc., Pasadena, Calif.

Filed May 31, 1973, Ser. No. 365,554
Int. Cl. F16f *1/34*
U.S. Cl. 165—71 **16 Claims**



1. a fluid tank comprising:

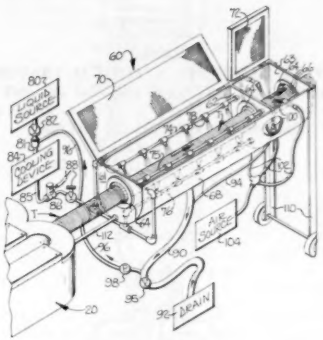
an enclosed shell adapted to convey a hot, moisture laden fluid therethrough by means of a fluid conduit defined with the inner wall of the shell and to separate and collect the moisture from the fluid passed therethrough at a preselected location in the tank, said shell including a moisture outlet, and

a valve mounted in the moisture outlet operative for draining the collected moisture out of the shell, said valve being mounted substantially within the tank so as to be exposed to the hot fluids being conveyed through the shell to thereby render the valve operative for a wide range of ambient temperatures including freezing temperatures.

3,854,527
APPARATUS AND METHOD FOR FABRICATING CORRUGATED PLASTIC TUBING

Ernest J. Maroschak, Box 878, Roseboro, N.C. 28382

Filed Sept. 1, 1972, Ser. No. 285,669
Int. Cl. F24h *3/02*
U.S. Cl. 165—120 **9 Claims**



1. An apparatus adaptable for cooling a horizontally advancing hot annularly corrugated plastic tube following the molding thereof and wherein the tube is delivered in a dry condition to facilitate subsequent processing thereof, said apparatus comprising

a housing including three horizontally spaced vertical walls defining a first zone between the first and second walls and a second zone between the second and third walls, each of said walls having an opening for passage of the tube therethrough in a horizontal direction,

means located in said first zone for directing a plurality of streams of liquid coolant against the corrugated exterior surface of the advancing tube disposed in said first zone, and

means in said second zone for directing a high velocity current of gas against the corrugated exterior surface of the advancing tube disposed in the second zone to remove the adhering residual liquid coolant therefrom and further cool the same.

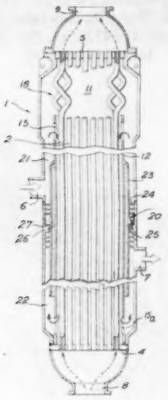
3,854,528
HEAT-EXCHANGER MODULE

Pierre Pouderoux, Meudon-la-Foret; Guy Salon, Le Chesnay, and Jean Andro, La Celle St-Cloud, all of France, assignors to Stein Industrie, Paris, France

Filed Feb. 6, 1973, Ser. No. 330,114
Claims priority, application France, Feb. 11, 1972, 72.04689
Int. Cl. F28b *9/22*
U.S. Cl. 165—158 **6 Claims**

1. A heat-exchanger unit comprising a tube bundle, an inner sleeve surrounding said bundle, openings located at the ends of the inner sleeve for admission and discharge of a first fluid into and from said bundle, an outer shell for the heat-exchanger unit spaced from said inner sleeve, a jacket on said inner sleeve extending downwardly between said sleeve and said outer shell a transverse partition-wall between said jacket and said shell, two annular spaces consisting of an upper and lower space between said wall and said jacket and said shell, external ducts opening into said spaces for the admission and discharge of a second fluid, and said ducts opening immedi-

ately adjacent to said partition-wall whereby minimum differential expansion under both steady-state and transient flow



conditions occurs between said outer shell and the tubes of said bundle.

3,854,529

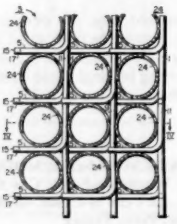
TUBE SUPPORT SYSTEM FOR A HEAT EXCHANGER

Stanley S. Sagan, Springfield, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 166,109, July 26, 1971, abandoned. This application Sept. 14, 1973, Ser. No. 397,492

Int. Cl. F28b *9/00*

U.S. Cl. 165—162 **4 Claims**



1. A tube support system for a heat exchanger having a plurality of tubes, said tube support system comprising a plurality of bars, each bar having a plurality of openings and arms disposed along each longitudinal margin thereof, the openings and arms on opposite margins being staggered, the arms of each bar being integral therewith, being longer than the tube's diameter, extending from said bar in one direction, and being generally normal thereto, the arms disposed along one margin being out of phase one half a pitch with the arms disposed along the opposite margin, and adjacent bars being mirror images, so that tips of the arms fixed to one bar register with openings in an adjacent bar, whereby the bars interlock to form a rigid support system.

3,854,530

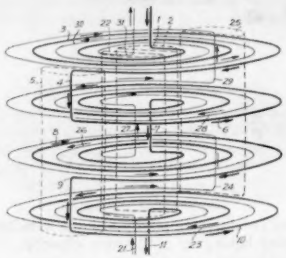
HEAT EXCHANGER

Etienne Jouet, 19 Rue du Panorama, 95 Montigny-les-Cormeilles, and Pascal Rebuffe, 18 Rue de Sevres, Boulonge-Billancourt, both of France

Division of Ser. No. 888,591, Dec. 29, 1969,. This application Sept. 20, 1972, Ser. No. 290,518

Int. Cl. F28f *3/00*

U.S. Cl. 165—163 **8 Claims**



1. A heat exchanger of generally cylindrical form acting between two fluids, comprising:

a. first and second chambers wound in juxtaposed and enclosing spirals; and a thin metal wall separating said chambers from each other, said metal wall having gofferings formed thereon and abutting against the wall of an adjacent chamber;

b. a central cylindrical tube, said chambers spirally encompassing said tube, fluid inlet and outlet means for said second chamber being formed by said tube;

c. an external cylindrical hoop concentrically encompassing said central tube and forming an annular space therebetween, said hoop and tube forming the supporting framework of said heat exchanger, said chambers being located in said annular space between said hoop and said tube, and said external cylindrical hoop axially extending beyond the level of said spirally coiled chambers;

d. closure caps attached to said cylindrical hoop so as to form two enclosures, said enclosures being in direct communication with said first chamber through the open lateral ends thereof and forming respectively inlets and outlets to said first chamber;

e. obturation means dividing into two portions forming, respectively, a distribution portion and a collector portion, said second chamber communicating with the distribution portion at its central portion and with the collector portion at the other end thereof;

f. and guide means being positioned within said second spirally coiled chamber and adapted to guide the fluid in said chamber to flow therealong in a centrifugal direction from the distribution portion of the tube substantially to the periphery of said chamber, and in a centripetal direction from the periphery of said chamber to the collector portion of said tube.

3,854,531

VISCOUS PETROLEUM RECOVERY PROCESS

Joseph T. Carlin, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Feb. 26, 1973, Ser. No. 335,979

Int. Cl. E21b *43/22*

U.S. Cl. 166—272 **9 Claims**

1. A method for recovering heavy oil from a subterranean reservoir having finite permeability without fracturing the reservoir wherein there is at least one injection well penetrating and in communication with the reservoir and at least one production well penetrating and in communication with the

reservoir by injection of fluids through the reservoir from the injection well to the production well which comprises:

A. injecting a first aqueous fluid into the reservoir through the injection well in order to establish communication in the reservoir between the injection and production wells,

B. injecting a second aqueous fluid into the reservoir through the injection well containing sodium hydroxide, guanidine hydrochloride and sodium oleate to spontaneously emulsify the oil in the reservoir and

C. injecting steam into the reservoir through the injection well and producing bitumen, steam, and aqueous fluids through the production well.

3,854,532

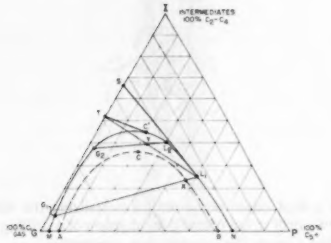
ENRICHED GAS DRIVE RECOVERY PROCESS

William B. Braden, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Oct. 6, 1972, Ser. No. 295,772

Int. Cl. E21b *43/16*

U.S. Cl. 166—274 **18 Claims**



1. A process for recovering hydrocarbons from a hydrocarbon-bearing reservoir having a hydrocarbon liquid phase and a gas saturation, traversed by at least one injection well and one production well, comprising the steps of:

a. determining the composition of a hydrocarbon solvent that is conditionally miscible with said liquid phase at the temperature and pressure of said reservoir,

b. injecting into said reservoir via said injection well a slug of said hydrocarbon solvent in an amount sufficient to establish a miscible transition zone of said slug with said hydrocarbon liquid phase,

c. injecting into said reservoir a drive fluid at a pressure and in an amount sufficient to maintain a drive of said slug and said reservoir hydrocarbons toward said production well and,

d. recovering said hydrocarbons via said production well.

3,854,533

METHOD FOR FORMING A CONSOLIDATED GRAVEL PACK IN A SUBTERRANEAN FORMATION

Derrel G. Gurley, New Orleans, La., and Claude T. Copeland, Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 312,797, Dec. 7, 1972, abandoned. This application Oct. 24, 1973, Ser. No. 409,357

Int. Cl. E21b *43/04, 43/26*

U.S. Cl. 166—276 **26 Claims**

1. A method of forming a permeably consolidated particulate mass in communication with a permeable subterranean formation which comprises:

a. forming a pumpable slurry by mixing together a particulate material, an epoxy resin-solvent mixture, a curing agent, and a carrier liquid to form a slurry, said particulate material ranging in size from about 0.1 to about 0.0025 inch in diameter and is present in an amount ranging from about 7 to about 20 pounds per gallon of liquid in said slurry, said resin-solvent mixture comprising an epoxy resin and a polar organic solvent for said resin, said solvent in conjunction with said resin being only partially miscible with said carrier liquid, said resin being present in an amount ranging from about 2 to about 10 pounds per 100 pounds of particulate material, said resin-solvent mixture containing from about 55 to about 85 percent by weight of resin,

b. introducing said slurry through a well bore and into a permeable formation which is subjected to fracturing pressure, and

c. curing said slurry in place in said formation to form a consolidated permeable mass.

3,854,534

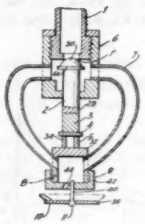
ROTARY AUTOMATIC SPRINKLER VALVE

Se Bin Pak, 44, Sam-Sun Dong 3-ka, Sung-Puk-ku, Seoul, South Korea

Filed Oct. 15, 1973, Ser. No. 406,240

Int. Cl. A62c *37/30*

U.S. Cl. 169—42 **5 Claims**



1. An automatic sprinkler valve comprising:

an upper chamber having closed top and bottom ends;

an inlet pipe entering said upper chamber through an opening in said top end, said inlet pipe having an end disposed within the interior of said upper chamber;

a lower chamber spaced below said upper chamber, said lower chamber having closed top and bottom ends;

a valve stem extending through said upper chamber bottom end into the interior of said upper chamber so as to normally abut against and seal said pipe end;

hollow support means interconnecting the interiors of said upper and lower chambers and securing said lower chamber to said upper chamber;

spray means including at least one passage through said lower chamber bottom end; and,

stem support means formed of a low melting point material interposed between the top of the lower chamber and said stem adapted to support the stem in said normal position.

3,854,535

FIRE INHIBITING FOAM SYSTEM

Clifton Leroy Kehr, and Nelson S. Marans, both of Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

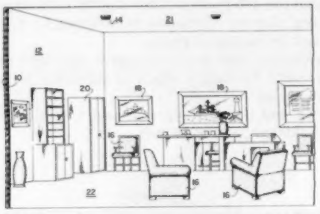
Filed Oct. 3, 1973, Ser. No. 403,242

Int. Cl. A62c *35/00*

U.S. Cl. 169—48 **6 Claims**

1. A fire inhibiting system which comprises in combination, a water outlet disposed to release water under fire or smoke conditions, a water-retaining foam structure disposed to re-

ceive water from said outlet, said foam being capable of absorbing and retaining from about 5 to about 50 times its dry



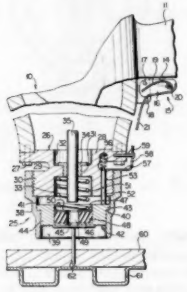
weight of water, and wherein the water outlet is disposed within the foam structure.

3,854,536

ADAPTER FOR FLUID OPERATED DRIVING TOOL

Robert L. Hallock, Jr., 48 Rockland Ave., Larchmont, N.Y. 10538

Filed Feb. 25, 1974, Ser. No. 445,766
Int. Cl. B25c *1/00, 3/00*
U.S. Cl. 173—15 **7 Claims**



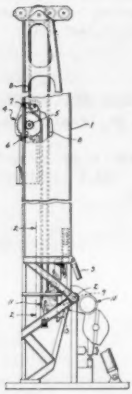
1. Apparatus for use with a tool having a power driven member for driving a fastener into a media which provides a predetermined resistance to the penetration of the fastener, said apparatus comprising holder means mounted for reciprocation coaxially of the power driven member and having a fastener engaging portion which is normally spaced outwardly of said power driven member, said holder means being constructed and arranged to permit said power driven member to contact the fastener without obstruction from said holder means, spaced inner and outer stop means limiting the movement of said holder means, resilient means normally urging said holder means toward said outer stop means, said holder means being movable toward said inner stop means upon engagement of the fastener with media of predetermined resistance prior to operation of said driving member, said resilient means not permitting movement of said holder means in media of less than said predetermined resistance, and linkage engaged by said holder means and conditioning said tool in non-driving state unless said holder means has moved to said inner stop means, whereby said fastener may be blind-nailed through an overlying media of less than said predetermined resistance into an underlying media having areas of greater and areas of less than said predetermined resistance and said power driven member will operate only when the fastener engages underlying media which is greater than said predetermined resistance.

3,854,537

TWIN PULL DOWN CHAIN EQUALIZER

Jack D. Nelmark, New Berlin, and Matthew Smith, Milwaukee, both of Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.

Filed Nov. 26, 1973, Ser. No. 419,218
Int. Cl. E21b *7/02*
U.S. Cl. 173—140 **3 Claims**



1. In a dual chain equalizer for equalizing the tension in chains of a drill string rotating mechanism of a drilling apparatus having a mast, the combination comprising:

two spaced, vertical equalizer frames slidably mounted on the mast, one of said equalizer frames being positioned on each side of the drill string axis;

each of said equalizer frames having a pair of vertically spaced sprockets rotatably mounted thereon in engagement with the chains of the drill string rotating mechanism, one of said sprockets being slidably disposed and biased downwardly against one of the chains of the drill string rotating mechanism;

an equalizer bar connected between said equalizer frames;

a slide member pivotably attached to the midpoint of said equalizer bar; and

a hydraulic cylinder associated with the mast and having one end connected with and activating said slide member for vertical displacement whereby said equalizer bar shifts said equalizer frames in response to variable chain pressures to keep the chains of the drill string rotating mechanism taut.

3,854,538

HYDRATED METAL OXIDE DEPOSITION

George O. Suman, Jr.; Edwin A. Richardson, both of Houston, and Ronald F. Scheuerman, Bellaire, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 221,401, Jan. 27, 1972, Pat. No. 3,756,315. This application Feb. 12, 1973, Ser. No. 331,930
Int. Cl. E21b *21/04*
U.S. Cl. 175—72 **6 Claims**

1. A drilling fluid filtrate-effected sand consolidating drilling process comprising:

drilling a borehole into a permeable granular subterranean earth formation while circulating an aqueous drilling fluid that contains an aqueous solution of an amphoteric metal oxide and a pH reducing reactant adapted to lower the pH of the solution to one at which a hydrated metal oxide is precipitated and suspended relatively finely divided solid particles adapted to form a fluid loss controlling filter cake on a permeable earth formation; and

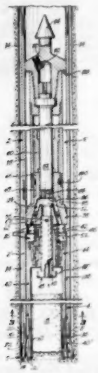
pressurizing said circulating drilling fluid within the borehole so that said permeable earth formation is invaded by the solution from which a hydrated metal oxide is subsequently precipitated.

3,854,539

HAMMER-DRILL CORE BARRELING DEVICE

Gerald T. Sweeney, Federal Way, Wash., assignor to Tigre Tierra, Inc., Puyallup, Wash.

Filed Aug. 23, 1972, Ser. No. 283,208
Int. Cl. E21b *1/06, 9/20*
U.S. Cl. 175—92 **32 Claims**



1. In combination, a rotary drill rod comprising an elongated pipe having a longitudinally extending bore therethrough and a percussive bit at the distal end thereof, means defining an abutment relatively transverse the bore adjacent the bit and operatively connected with the bit to receive and transmit hammer blows into the working face of the bit, drive means including a piston-like member retractably inserted in the bore in slidable engagement with the wall thereof and having a fluid operated hammer mechanism thereon, the hammer of which is reciprocable between the member and the abutment to apply the blows to the abutment, fluid transmission means for operating the hammer mechanism including means for passing fluid through the piston-like member and means for exhausting the fluid into the region adjacent the working face of the bit after the mechanism has operated, means on the rod whereby the exhausted fluid can discharge from said region toward the proximal end of the pipe on the opposite side of the pipe from the piston-like member, and means on the piston-like member for generating a pressure differential across the drive means longitudinally of the bore to maintain the mechanism in operative relationship to the abutment during the application of the blows.

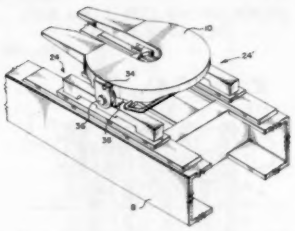
3,854,540

VEHICLE WEIGHING MEANS

Godfrey A. Holmstrom, Jr., 895 S.W. Cedar Glade, Issaquah, Wash.

Filed Aug. 3, 1973, Ser. No. 385,288
Int. Cl. G01g *19/08*
U.S. Cl. 177—136 **5 Claims**

1. A fifth wheel weighing system for sensing the weight of a trailer transmitted to the fifth wheel of a tractor which comprises two load cells spaced apart and secured to the tractor, each load cell comprising transducer means including an elongated bending beam secured at its ends and adapted to deflect upon application of a downward load at the beam midsection, strain sensing means applied to said bending beam to provide electrical signals proportional to vertical loads applied to said beam midsection, and fifth wheel support means secured to and extending above said beam midsection; a fifth wheel in load bearing contact with said fifth wheel support means; connecting means securing said fifth wheel to the fifth wheel support means of each load cell such that said



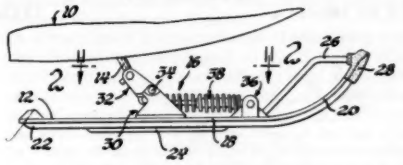
fifth wheel is able to shift position and remain in continuous load bearing contact with both fifth wheel support means such that vertical loads applied to said fifth wheel are transferred to the beam midsections through respective fifth wheel support means.

3,854,541

SNOWMOBILE SKI SUSPENSION ASSEMBLY WITH HORIZONTAL SHOCK ABSORBER MEANS

Harold E. Hollnagel, 918 W. Laramie Ln., Milwaukee, Wis. 53022

Filed Mar. 16, 1973, Ser. No. 342,017
Int. Cl. B62m *27/00*
U.S. Cl. 180—5 R **16 Claims**



1. A suspension assembly comprising: bracket-support means, lever arm means attached for pivotal movement to said bracket-support means, said lever arm means being attached to said bracket-support means at a point lying between the end of said lever arm means, stop means for limiting the pivotal motion of said lever arm means in a first direction, and resilient means for resisting pivotal motion of said lever arm means in a second direction and for continuously urging said lever arm means in said first direction toward said stop means.

3,854,542

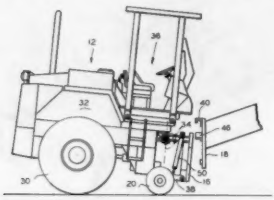
MODULAR VEHICLE COUPLING

Ronald M. Jesswein, Berrien Springs; Richard R. Hushower, Buchanan, and Ralph M. Duttarer, Saint Joseph, all of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed May 20, 1974, Ser. No. 471,379
Int. Cl. B60d *7/00*
U.S. Cl. 180—12 **4 Claims**

1. In a modular vehicle which is separable into a tractor module and an implement module the combination comprising, a first coupling plate forming a portion of the tractor module, a second coupling plate forming a portion of the implement module and detachably connectible to the said first coupling plate, the two coupling plates being in confronting position when in coupling relation, the said first coupling plate having a transverse horizontally disposed upper edge and a

pair of sloping guide edges adjacent the respective ends of the said upper edge, an upper bracket secured to the said second coupling plate and extending over the said first coupling plate in contact with the said upper edge when the coupling plates are in coupling relation, the said upper bracket having a downwardly projecting portion adjacent the back surface of the said first coupling plate whereby during a coupling operation



movement of the said first coupling plate either forwardly or rearwardly produces movement of the said second coupling plate in the same direction, and a pair of guide brackets secured to the said second coupling plate and located where they are contacted by the said sloping edges on the first coupling plate when the first coupling plate is raised upwardly to bring the said upper edge on the first coupling plate in contact with the said upper bracket on the second coupling plate.

3,854,543

AUXILIARY DRIVEN AXLES

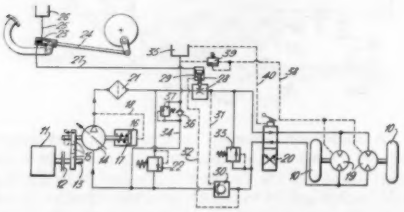
Charles Hartley Hull, Huddersfield, England, assignor to David Brown Tractors Limited, Huddersfield, England

Filed May 8, 1973, Ser. No. 358,276

Claims priority, application Great Britain, May 24, 1972, 24551/72

Int. Cl. B60d *7/00*

U.S. Cl. 180—14 A **13 Claims**



1. An auxiliary driven axle of a power driven vehicle or of a trailer for such a vehicle having hydrostatic drive means including a hydraulic pump driven at a speed proportional to that of the power unit of the vehicle with control means for automatically varying the rate of its delivery in inverse proportion to the pressure of its delivery.

3,854,544

SYSTEM FOR MOVING FURNITURE

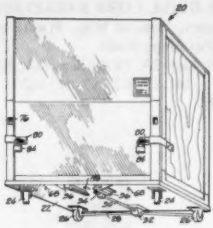
Cirilo Kolchev, 1243 15th Ave., San Francisco, Calif. 94122

Filed Aug. 10, 1973, Ser. No. 387,499

Int. Cl. B60d *1/00*

U.S. Cl. 180—14 E **7 Claims**

1. A container of the kind that can be erected for loading and knocked down for storage, said container comprising, a floor, wheel means on the bottom of the floor, collapsible wall and top means, and connecting means for connecting the wall and top means to form a rigid container when erected for loading and for disconnecting the wall and top means to a stack on the floor when collapsed for storage, and wherein the collapsible wall and top means include two separate sidewall panels and a single hinged member comprising back wall, top wall, front wall panels connected together by hinges for folding to a flat condition by an accordion type fold, and wherein



the wheel means include wheels at the corners of the floor, the wheel means include a drive shaft connected to at least two laterally spaced wheels and a drive connection for engaging a drive motor with the drive shaft to power the wheels.

3,854,545

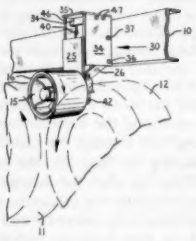
POWER TRANSFER UNIT FOR TANDEM WHEELS

Frederick J. Barcroft, 7700 S.W. Garden Home Rd., Portland, Oreg. 97223

Filed Apr. 20, 1973, Ser. No. 352,896

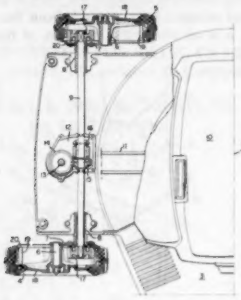
Int. Cl. B62d *61/10*

U.S. Cl. 180—24.12 **4 Claims**



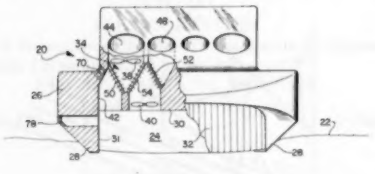
1. A power transfer wheel unit for frictionally driving a road wheel on a dead axle from a road wheel on a drive axle in a tandem axle vehicle suspension, comprising a vertical plate adapted for mounting on an outside vertical face of a longitudinal frame member of the vehicle, link arms pivotally supported from said plate, a support member pivotally mounted on said link arms, said plate, link arms and support member forming a parallelogram linkage for vertical movement of said support member, a fluid pressure cylinder having a piston connected with said support member, a horizontal pivot pin on said support member, a vertical arm pivotally mounted on said pivot pin, a horizontal stub shaft on said vertical arm, and a friction wheel on said stub shaft having an operative position engaging tires on both of said road wheels and having an inoperative position retracted away from said tires, said unit being wholly mounted on said outside face of the vehicle frame member.

3,854,546
PROPULSION DEVICE
Kjell Arne Andersson, Huskvarna, Sweden, assignor to Huskvarna Vapenfabriks Aktiebolag, Huskvarna, Sweden
Filed Nov. 13, 1972, Ser. No. 306,334
Claims priority, application Sweden, Nov. 12, 1971, 14499
Int. Cl. B60k *17/04*
U.S. Cl. 180—70 R 5 Claims



1. A transmission assembly for driving at least a pair of wheels of a vehicle having a chassis which wheels are parallel and offset in relation to each other in the driving direction of the vehicle, comprising a driven shaft, axles of rotation of said wheels and a gearing arrangement housed within each wheel and provided with a pinion gear mounted on each end of said shaft to be rotated therewith and a gear secured to the wheel, said pinion gear at the one and the other end of said shaft engaging the respective one of said other gears in front of, respectively behind the axle of rotation of each wheel.

3,854,547
AIR CUSHION VEHICLE
Arnold M. Hall, Westerly, R.I., assignor to Hovermarine Corporation, Pittsburgh, Pa.
Filed Dec. 18, 1973, Ser. No. 425,849
Int. Cl. B60v *1/04*
U.S. Cl. 180—117 11 Claims



1. An air cushion vehicle adapted for travel over a surface comprising:

a hull;

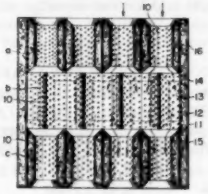
structure for maintaining a cushion of pressurized fluid beneath said hull at least partially supporting said hull above the surface as it proceeds;

duct means extending between ambient fluid and the cushion of pressurized fluid;

first and second sources of pressurized fluid for delivery to the cushion, said first and second sources located in said duct means; and

louver means in said duct means selectively operable to arrange said first and second sources in a series relationship to thereby obtain optimum pressure in the cushion under one occurring condition and to arrange said first and second sources in a parallel relationship to thereby obtain optimum flow into the cushion under another occurring condition.

3,854,548
SILENCING APPARATUS
Hisao Suzuki, 2-1-1, Taibeidai Tsujido, Fujisawa-shi, Kanagawa-ken, Japan
Filed Aug. 1, 1973, Ser. No. 384,581
Int. Cl. F01n *1/08*
U.S. Cl. 181—56 1 Claim



1. A silencer for noise-generating gases comprising: an elongated casing opening axially from end-to-end,

said casing having a closed outer wall and a porous inner wall spaced from the outer wall and a sound-absorbing material disposed therebetween;

a plurality of individual silencing tubes disposed in axially spaced stages extending along the length of said casing, each of the stages of the silencing tubes comprising a plurality of mutually parallel, peripherally engaged individual tubes disposed parallel to the longitudinal axis of the casing and the gases passing therethrough, the plurality of tubes of each of the respective stages substantially filling the cross section of the casing in which they are disposed,

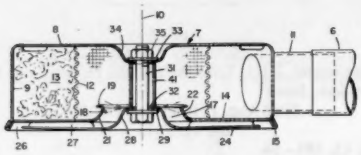
each of the tubes of an upstream stage of tubes being laterally offset so that the longitudinal axis thereof is offset with respect to tubes of a next adjacent stage of tubes, the ends of adjacent tubes of adjacent stages of tubes abutting so that gases leaving an upstream tube pass interiorally and exteriorally of next adjacent tubes of the next adjacent stage of tubes, so that the individual tubes continuously divide the streams of gas entering the casing from the inlet and subdivide and modulate the streams of gas as it moves in individual streams from stage-to-stage,

each of the individual tubes comprising concentric, perforated, axially spaced sleeves with sound-absorbing material in the space therebetween, said tube sleeves being connected at opposite ends by annular collars converging axially from opposite ends of the individual silencing tubes whereby sound generated by the gases passing through the silencing tubes is absorbed by the sound-absorbing material of the casing and individual tubes as the paths of travel of the gases is continuously altered and frequency is changed from stage-to-stage.

3,854,549
REED MUFFLER
Paul S. Moller, Davis, Calif., assignor to Discajet Corporation, Davis, Calif.
Filed Oct. 10, 1973, Ser. No. 405,059
Int. Cl. F01n *1/08*
U.S. Cl. 181—58 3 Claims

1. A reed muffler for an internal combustion engine having an exhaust duct comprising means defining a circular-cylindrical chamber disposed about an axis, said chamber having a substantially tangent inlet connected to said duct and having an outlet, said outlet being of Venturi form and having a throat symmetrical with said axis; a plurality of flexible,

radial reeds arranged in a disc-like, planar array of substantially the size of said throat; and means for mounting said array



in said outlet with the plane of said array normal to said axis and substantially in said Venturi throat.

3,854,550

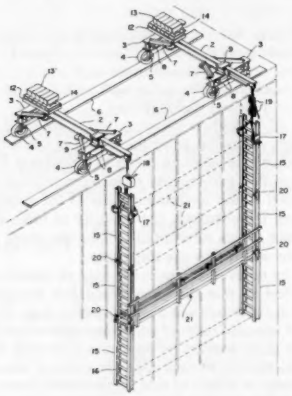
MOBILE OUTRIGGER FOR SCAFFOLDS

Thomas M. Shingler, Pittsburgh, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 317,180, Dec. 21, 1972,. This application June 1, 1973, Ser. No. 365,955

Int. Cl. E04g *3/10*

U.S. Cl. 182—36 **5 Claims**



1. In combination with a scaffold and suspension means therefor, a vehicular outrigger movably mounted on tracks on the roof of a building for moving the scaffold alongside the building and around corners thereof, comprising a pair of spaced parallel trucks, each in the form of a beam mounted on a pair of casters having brake means for locking the casters in any selected position, a beam guide mounted on and transversely of each truck, a beam extending transversely of said trucks and telescopically fitted through said beam guides and including an extension to adjustably move said suspension means and scaffold towards and away from the side of a building so that said scaffold can be maneuvered around a building corner and clear all structural surfaces, each truck being strutted into said transversely extending beam by a pair of angular extending ties integrally secured at each end to said truck and transverse beam, respectively.

3,854,551

TREE STAND AND SEAT

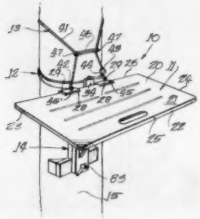
Gerald L. Lindow, 175½ E. North Water St., Nennah, Wis. 54956

Filed Dec. 5, 1973, Ser. No. 421,857

Int. Cl. A47c *9/10*

U.S. Cl. 182—187 **4 Claims**

1. A combination stand and seat adapted for support from a tree or other upstanding support comprising a substantially flat rectangularly shaped platform having a top surface, a bottom surface, a front edge, a back edge, and opposed side edges, an elongated slot formed in the platform adjacent the front edge thereof and defining a handle carrying member for use in the transporting of the stand between locations of usage, a flexible strap affixed intermediate its terminal ends to the back edge of said platform and adapted to be slung about the circumference of the tree in a manner to retain the platform secured to the tree, a flexible safety rope having one end affixed to the platform adjacent the back edge thereof with the opposite end adapted to be passed about the circumference of the tree at a level above the position of the strap about the



tree, the free end of said rope adapted to be releasably secured to said back edge of said platform at a position spaced apart from the opposite end of said rope, a vertically extending support bracket affixed at its top end to the back edge and bottom surface of said platform with said bracket extending vertically downwardly therefrom to terminate at a terminal edge, a pair of horizontally disposed wedge forming members adjustably secured to the terminal edge portion of said bracket and extending laterally outwardly of opposite sides of said bracket, and means adjustably retaining said wedge members in adjusted positions relative to each other to engage the circumference of the tree for stabilizing and supporting said platform on said tree.

3,854,552

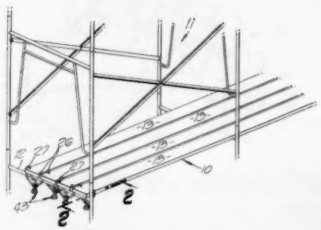
SCAFFOLD PLANKING CLAMP

Milo M. Kensrue, 2265 S. Grand, Santa Ana, Calif. 92705

Filed July 2, 1973, Ser. No. 375,528

Int. Cl. E04g *5/08*

U.S. Cl. 182—222 **4 Claims**



1. A device for anchoring a scaffold planking to a scaffold supporting structure, comprising:

a. means positioned on the underside of the planking for grippingly engaging a cross-member of the structure, said means comprising a clamping bar engageable with the cross-member and an under surface of the planking;

b. force applying means connected with said first means having a portion adapted to extend over and engage the upper surface of the planking, said force applying means comprising a pair of elongate hook members connected with a nut, one of the hook members having a fixed con-

nection with the nut and the other a hinged connection, each hook member having a deflected outer end portion adapted to overlie the upper surface of the planking; and

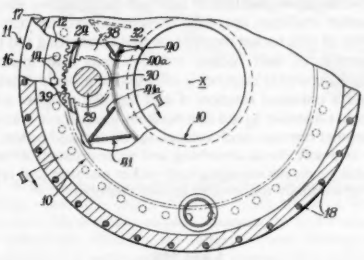
c. actuating means operable to move said force applying means so that said portion is clampingly forced against the upper surface of the planking, said actuating means comprising a manually operable screw member rotatably carried by said clamping bar and having threaded engagement with said nut.

3,854,553

LUBRICATION SYSTEM FOR SWING GEAR DRIVE

Calvin L. Miller, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 1, 1973, Ser. No. 411,774
Int. Cl. F16n *29/00*
U.S. Cl. 184—6.12 **5 Claims**



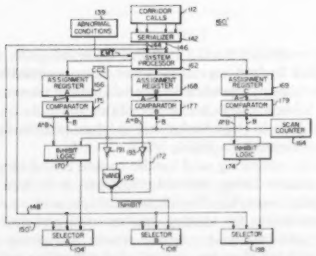
1. A gear drive mechanism comprising a horizontally disposed, annular ring gear having teeth formed thereon which face radially inwardly towards a vertically disposed central axis thereof and a pinion gear mounted for rotation about a vertically disposed axis thereof, parallel to said central axis, and meshing with the teeth of said ring gear, an annular enclosure enclosing said gear drive mechanism in an annular chamber thereof and lubricating means, including at least one member disposed in said chamber on a circumferential side of said pinion gear, for continuously pressing a lubricant into meshing teeth of said ring and pinion gears.

3,854,554

ELEVATOR SYSTEM

Clyde A. Booker, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1973, Ser. No. 340,616
Int. Cl. B66b *1/18*
U.S. Cl. 187—29 R **13 Claims**



1. An elevator system, comprising:

a structure having a plurality of landings,

a plurality of elevator cars mounted for movement relative to the landings,

means for registering calls for service from the landings,

car control means for each of said elevator cars,

means connecting the calls for service to the car control means of said elevator cars, said car control means being operable for moving its associated elevator car in response to calls for service,

and system control means, said system control means being responsive to said calls for service to assign at least certain of said calls to predetermined elevator cars by providing assignment signals for the car control means of all of the elevator cars,

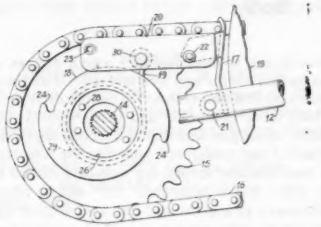
said assignment signals overriding and preventing each car control means from considering an assigned call for service which has not been assigned thereto.

3,854,555

PEDAL OPERATED SHOE BRAKE FOR JUVENILE BIKE

Carter E. Quisenberry, Olney, Ill., assignor to AMF Incorporated, White Plains, N.Y.

Filed Feb. 21, 1974, Ser. No. 444,286
Int. Cl. B62l *1/04*
U.S. Cl. 188—24 **1 Claim**



1. A shoe brake for the rear wheel of a juvenile bike, comprising a brake shoe pivoted off the bike frame in front of the rear wheel, a cam wheel and spacer collar rotatable with a bike pedal crank, said cam wheel being positioned adjacent to a bike pedal hanger tube and being spaced from a bike sprocket by said collar, a link pivotally connected to said brake shoe and extending therefrom to said cam wheel, a pin on said link overlying said cam wheel and lobes on said cam wheel for engagement with said pin, and a spring for disengaging said pin from said lobes and said brake shoe from said rear wheel when pedalling forward, but allowing said lobes to engage said pin when reverse pedalling to engage said brake shoe with said rear wheel through said link, said spring being stiff and having several turns loose on said collar between said cam wheel and sprocket, and one end of said spring being disposed behind said collar alongside said cam wheel and being pivotally connected to said link between said pin and brake shoe.

3,854,556

ANTI-SKID SYSTEM HAVING IMPROVED SENSOR

Thomas A. Gee, Allen Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 27, 1973, Ser. No. 428,709
Int. Cl. B60t *8/08*
U.S. Cl. 188—181 R **14 Claims**

1. An anti-skid system for relieving brake forces applied to at least one independently rotatable wheel in response to a skid signal comprising:

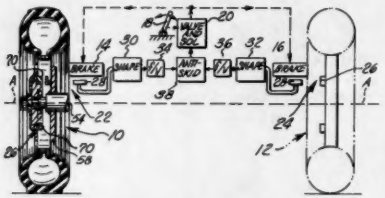
anti-skid control circuit means for providing a said skid signal in dependence upon a received wheel speed signal representative of the wheel speed of a said wheel;

wheel speed signal generating means including a variable reluctance wheel speed sensor, said sensor including a

stationary stator and a rotor adapted to be mounted on said wheel for rotation therewith in close proximity to said stator and cooperating with said stator to define an air gap therebetween;

said rotor including an annular ferromagnetic member having an annular array of teeth with adjacent teeth being separated by a recess, each said tooth extending toward said stator and terminating in a pole face having a width in the direction of rotation corresponding with the width in the same direction of each said recess;

said stator comprising means for defining a magnetic flux source and a split magnetic flux path, said defining means including spaced apart first and second leg members which define, at least in part, first and second magnetic



circuits and a third member which defines a common magnetic path for said first and second magnetic circuits, each said first and second leg member having a pole face which faces said rotor and being spaced therefrom to define an air gap, said first and second leg members being oriented and configured such that the reluctance change in said first and second leg members caused by rotation of said rotor is essentially 180° out of phase and the reluctance change in said first and second leg members caused by a like change in said air gap spacing is essentially in phase, coil means for providing an output signal in dependence upon said reluctance changes such that essentially no output signal is provided when said reluctance changes are in phase.

3,854,557

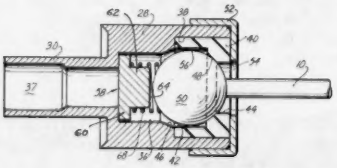
UNIVERSAL JOINT FOR PISTON-CONNECTING ROD ASSEMBLY

Lance C. Wilcox, Wilton, Conn., assignor to Airpot Corporation, Norwalk, Conn.

Continuation of Ser. No. 8,449, Feb. 4, 1970, abandoned. This application Mar. 13, 1972, Ser. No. 233,898

Int. Cl. F16f *9/34*

U.S. Cl. 188—322 **10 Claims**



1. In a miniature damping dashpot for use in electromagnetic assemblies or the like, a piston-connecting rod assembly for universally pivotally mounting a connecting rod in force transmitting relationship to a piston comprising a ball-like member rigidly mounted on said connecting rod, an element operatively connected to said piston and having an open-ended chamber therein, said connecting rod extending into said chamber with said ball-like member received therein, and retainer means having an aperture through which said connecting rod extends with lateral clearance therearound; the improvement comprising a socket member formed substantially completely of soft easily deformable rubber-like elastomeric material received, with substantially no deformation thereof, within said chamber and having a concave ball-like inner surface adapted to operatively engage the outer surface of said ball-like member along an area shaped to conform to a substantial portion of the surface of said ball-like member with substantially no deformation of said concave surface, said socket member surface having an aperture in registration with said aperture on said retainer means through which said connecting rod extends with lateral clearance therearound, the lateral clearance between said connecting rod and both said apertures being sufficient to permit said connecting rod a degree of universal movement relative to said element as it moves angularly relative to said cylinder, said socket member aperture being of a size normally insufficient to allow passage of said ball-like member therethrough, said elastomeric material surrounding said aperture in said socket member being yieldable to allow insertion of said ball-like member through said socket member aperture, thereby to provide for the mounting of said socket member on said connecting rod prior to insertion of said socket member into said chamber, whereby said socket member is effective to provide a bearing surface for universal rotation of said ball-like member within said socket member to act as a resilient linear force transmitting member between said connecting rod and said piston, and to act as a soft shock-absorbing and wear-resistant element, said retainer means engaging said socket member and retaining it substantially immovably in said chamber.

3,854,558

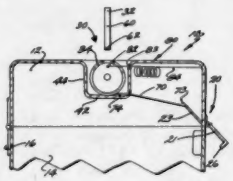
TACKLE BOX LATCH

Steve Corson, R.R. No. 1, Luther, Mich. 49656

Filed July 30, 1973, Ser. No. 383,502

Int. Cl. A45c *13/10*

U.S. Cl. 190—58 A **6 Claims**



1. In a container having a base, a cover hingedly mounted to said base for closing same, a handle associated with said cover for carrying the container, and latching means shiftable between locked and unlocked positions for maintaining said cover and base in closed relationship when in locked position, the improvement comprising:

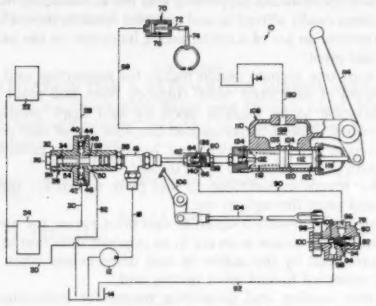
means for mounting said handle to said cover, said mounting means being shiftable between a handle-securing position and a handle-release position; and

actuator means for shifting said mounting means between said positions, said actuator means operatively connecting said latching means and said mounting means, said actuator means shifting said mounting means to said handle-securing position when said latch is in locked position, and to said handle release when in unlocked position.

3,854,559
CONTROL SYSTEM FOR A HYDRAULICALLY-OPERABLE BRAKE AND TRANSMISSION

John Frank Talak, and John Lester Hobson, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Oct. 1, 1973, Ser. No. 402,395
Int. Cl. B60k *29/02*
U.S. Cl. 192—4 A **12 Claims**



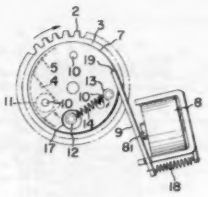
7. A hydraulic brake and transmission control system comprising: a normally engaged vehicle brake means; a fluid pressure operable actuator means connected to said brake means for selectively releasing the latter; a pump having an inlet connected to a sump and an outlet connected to said actuator means; said outlet also being connected to said sump through brake control valve means including a normally closed valve means acting to block the flow of fluid between the pump outlet and the sump; a manually operable actuator means connected to said brake control valve means for selectively effecting an open condition therein; fluid operable transmission means including actuating fluid passage means connected to said sump by means including a normally open pilot-operated dump valve means; said pump outlet also being connected to said fluid-operable transmission means, exclusive of said dump valve means and to a pilot port of said dump valve means, the dump valve means being responsive to a pre-determined minimum pressure of the fluid delivered by said pump at said pilot port to block the flow of fluid between the actuating fluid passage means of said transmission means and the sump, whereby fluid pressure will be available to operate said transmission, when the pump is operative to deliver said minimum pressure, until said normally closed brake control valve means is opened to connect the pump to the sump thus resulting in a pressure drop at said dump valve means, the latter then acting to connect the transmission means operating fluid to sump.

3,854,560
LATCH OPERATED CLUTCH

Tatsuo Nishikawa, and Toshiaki Ozawa, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1973, Ser. No. 350,647
Claims priority, application Japan, Apr. 19, 1972, 47-38683
Int. Cl. F16d *41/02, 15/00*
U.S. Cl. 192—27 **8 Claims**

1. A latch operated clutch comprising, a continuously rotating cylindrical main rotary member, a follower rotary member loosely fitted in said main rotary member, said follower rotary member being provided with at least one cut-away portion in the peripheral surface thereof, a roller disposed in said cut-away portion, a disc having mounted thereon a first supporting means for said roller, a second supporting means mounted on the front surface of said follower rotary member, said disc being provided with an opening at a position corresponding to said second supporting means, a third supporting means mounted on the front surface of said disc, biasing means extended between said second and third supporting means for biasing said follower rotary member and said disc in respectively opposite rotational directions so that said follower rotary member and said roller are in engagement, releasing

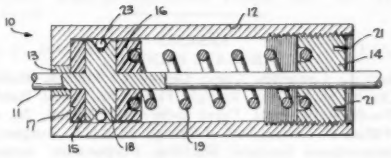


means for releasing the engagement between said follower rotary member and said roller when in a non-transmission mode, stopping means for stopping the rotation of said disc, and control means for controlling said stopping means for converting a continuous rotation of said main rotary member into an intermittent rotation of said follower rotary member.

3,854,561
UNIDIRECTIONAL SLIP CLUTCH

Hector O. Conde, El Cerrito, Calif., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed May 9, 1973, Ser. No. 358,610
Int. Cl. F16d *47/04, 41/07*
U.S. Cl. 192—48.92 **2 Claims**

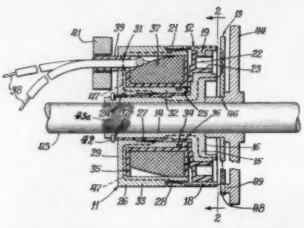


1. Apparatus which functions as a unidirectional slip clutch comprising: a shaft; a cylinder mounted in bearings on said shaft; said shaft having fixedly mounted thereon within the cylinder a disc-shaped means having a plurality of peripherally spaced grooves located in the circumference thereof, each groove receiving a ball therein and having a shallow portion at one end of the groove and a deep portion at the other end, the grooves being triangular shaped, with the shallow portion of the groove being located at the end of the groove which corresponds to the apex of the triangle; first and second friction discs mounted on the shaft, said first friction disc being located between the disc-shaped means and one inner end wall of the cylinder, said second friction disc being located on the opposite side of said disc-shaped member; a spring located within the cylinder, one end of said spring engaging said second friction disc, the other end engaging an axially adjustable means carried by said cylinder so that the torque between the shaft and cylinder may be varied by varying the pressure on said spring, said bearings being located on the ends of said cylinder, one of said bearings being threadedly carried at the end of said cylinder remote from said disc-shaped means and defining said axially adjustable means, the threadedly carried bearing being provided with at least one recess in its outer surface for engagement by rotating means.

3,854,562
ELECTROMAGNETIC CLUTCH

Robert Hugh Wilczewski, Roselle, Ill., assignor to Victor Comptometer Corporation, Chicago, Ill.

Filed Aug. 15, 1973, Ser. No. 388,454
Int. Cl. F16d *27/10*
U.S. Cl. 192—84 C **11 Claims**

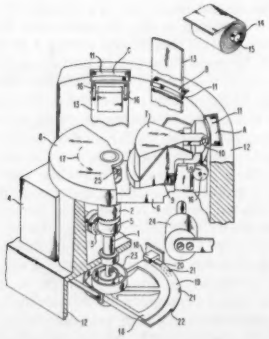


1. An electromagnetic clutch mounted on a supporting shaft, comprising a unitary rotor having a hollow cylindrical inner portion of magnetic material secured to said shaft with a radially extending flange at one end, an outer collar portion of magnetic material, and a thin-walled connecting member of non-magnetic bearing material injection molded to secure said inner and outer portions together in radially spaced relation and define a cylindrical bearing, a stationary field comprising a coil housing of magnetic material having a bore supported by said bearing and inner and outer axial flanges joined by an outer end wall to define an annular recess, a bobbin of non-magnetic plastic mounted in said recess, a toroidal coil wound on said bobbin, and an armature disc movable axially into contact with said rotor in response to energization of said coil; and a drive member rotatably mounted on said shaft and having relative axially slidable and non-rotatable engagement with said armature disc.

3,854,563
ARCUATE PRINTER

Robert L. Cowardin, Cary; George C. Matuck, Raleigh; Charles M. McCray, Raleigh; Flavius M. Powell, Raleigh; Woodrow W. Pratt, Cary; Delbert C. Thomas, Jr., and William D. Thorne, both of Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 25, 1973, Ser. No. 373,057
Int. Cl. B41j *1/24*
U.S. Cl. 197—1 R **5 Claims**



1. Media marking apparatus, comprising:

at least one mark producing means for making visible marks on a medium;

support means for supporting said mark producing means in proximity to a medium to be marked and in a position to make a mark when said mark producing means is operated;

pivot means mounted at a fixed radial distance from said medium and supported in bearings for rotation about the central axis of said pivot, said axis being perpendicular to the radius establishing said radial distance;

said support means supporting said mark producing means being rigidly affixed to said pivot for rotation therewith to traverse an arc of a circle having its center on the axis of said pivot;

at least one arcuate platen means for supporting said medium at said fixed radial distance from said pivot in a position to be marked upon by said mark producing means while it traverses said arc, said arc of said platen means being cylindrical and having its axis coincident with said axis of said pivot means;

drive means connectable to said pivot means for turning said pivot through an arc;

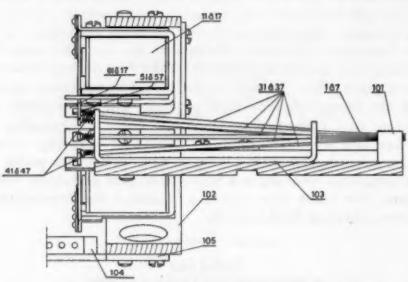
return drive means coupled to said pivot means for turning said pivot means in an arc in an opposite direction to that produced by the action of said drive means when it is connected to said pivot means; and

motion sensing and quantizing means for indicating the rotation of said pivot and for signalling the relative amount of travel along said arc taken by said support means and said mark producing means in response to said drive means.

3,854,564
PRINTING HEADS FOR PRINTING MACHINES

Bernard Henri Gabriel Flaceliere, and Jean-Pierre Talvard, both of Allee des Elfes, France, assignors to Logabax S.A., Arcueil, France

Continuation of Ser. No. 169,759, Aug. 6, 1970, abandoned. This application July 9, 1973, Ser. No. 377,659
Claims priority, application France, June 17, 1970, 70.2241
Int. Cl. B44j *1/34*
U.S. Cl. 197—1 R **1 Claim**



1. A printing head device including slidable elongate marker needle elements projectable against an anvil during striking a straight line of dots of a selected character, the device including a body having a longitudinal axis of symmetry, a plurality of electromagnets each having a frame mounted within said body and radially projecting towards said axis of symmetry, said frame including a blade-like armature extending radially towards said axis of symmetry and having a movable radially inner end, the inner ends of said armatures being centrally disposed in a circular array about the axis of symmetry of the said body; the needle elements directly cooperating at a first end with the respective inner ends of the armatures, and having at a second end, terminal portions parallel to said axis of symmetry, a supporting member se-

cured to the said body, said supporting member including a rigid guide member for guiding said terminal portions in a common plane in which the adjacent terminal portions are adjoining each other; said supporting member further including first and second spaced further guide members for guiding and supporting the needle elements at first and second points intermediate between the first and second ends thereof; and lubricated exposed Bowden cable sheaths, each having first and second ends respectively secured to said first and second further guide members, said Bowden cable sheaths respectively surrounding the respective needle elements between said first and second points.

3,854,565

MAGAZINE FOR A TYPEWRITER RIBBON SPOOL

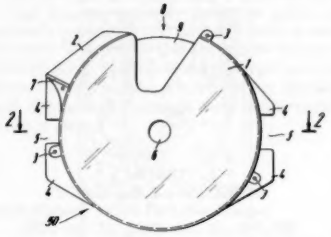
Wolfgang Kupferschmidt, Resse, and Dietrich Lison, Hannover, both of Germany, assignors to Firma Gunther Wagner, Hannover, Germany

Filed Oct. 16, 1972, Ser. No. 297,837

Claims priority, application Germany, Oct. 21, 1971, 7139793

Int. Cl. B41j *33/14*

U.S. Cl. 197—151 **4 Claims**



1. A magazine for holding a typewriter ribbon spool having an inner edge on a typewriter frame, comprising a substantially cylindrical flat container having a lid wall with a typewriter spool centering pin formation and an opposite wall spaced therefrom by an amount to accommodate the typewriter ribbon spool therebetween, a centering ring on the opposite wall for centering the spool around said centering pin formation, and engagement means defined on said container for anchoring said container against rotation with respect to said typewriter, said centering ring comprising an individual end formation on said opposite wall defining a bearing wall opposing the inner edge of the typewriter ribbon spool, and said centering pin formation comprising an indentation having an interior solid wall portion of circular configuration for centering the typewriter ribbon spool, whereby said magazine is engageable and useable with a variety of typewriter models without the necessity of passing bolt means completely through the magazine to secure the magazine to the typewriter frame.

3,854,566

PHOTOELECTRIC TABULATING APPARATUS

George R. Ellis, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 25, 1973, Ser. No. 363,918

Int. Cl. B41j *25/18*

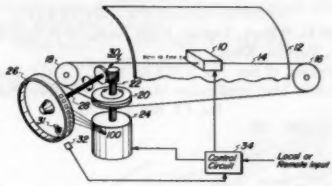
U.S. Cl. 197—176 **5 Claims**

1. Tabulator apparatus for use in a printer having relative movement in fixed increments between a printing mechanism and a recording medium, said apparatus comprising

a cylindrical shell connected for rotation in synchronism with said relative movement, said shell having a plurality of apertures along a line of rotation of said shell, said apertures being spaced along said line to correspond to said fixed increments,

a plurality of shutters slidably mounted on said shell, each of said shutters being associated with a respective one of said apertures and having an opening therein selectively alignable with a respective aperture,

a light source mounted to transmit light to said apertures, and



a phototransducer having an output terminal for providing a signal thereon when light from said light source impinges on said phototransducer, said phototransducer being mounted in spatial relation to said shell so that said apertures pass said phototransducer in correspondence with the relative movement of said printing mechanism and said recording medium, light from said light source impinging on said phototransducer only when a shutter opening is aligned with a respective aperture passing said phototransducer.

3,854,567

DEVICE FOR CONVEYING ROD-SHAPED OBJECTS SUCH AS CIGARETTES

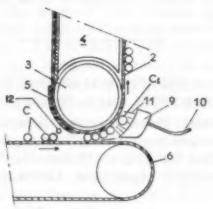
Raymond Poupin, Fleury-Les-Aubrais, and Henri Anfossi, Orleans, both of France, assignors to Service D'Exploitation Industrielle Des Tobacs Et Des Allumettes, Paris, France

Filed Dec. 20, 1971, Ser. No. 210,029

Claims priority, application France, Dec. 23, 1970, 70.46369

Int. Cl. B65g *47/00*

U.S. Cl. 198—20 C **1 Claim**



1. A device for conveying and grouping substantially rod-shaped articles comprising first, upstream, smooth conveyor means for carrying a single layer of said rod-shaped articles and second, downstream, smooth conveyor means, said second conveyor means having a perforated conveying surface and associated suction means operable to urge said rod-shaped articles into contact with the conveying surface of said second conveyor means, said first and second conveyor means being disposed, relative to one another, so as to define a transferral zone in which rod-shaped articles disposed crosswise on the conveying surface of said first conveyor means are transferred to the conveying surface of said second conveyor means by the urging of said suction means, and braking means downstream of said transferral zone comprising a source of air current so disposed as to deliver said air current in opposition to the direction of passage of said rod-shaped articles exiting from said transferral zone, said braking means being operable

to delay the passage of single, ungrouped rod-shaped articles on said second conveyor means downstream from said transferral zone until parallel to and contiguously grouped with at least one other rod-shaped article and to permit a plurality of such parallel and contiguously grouped rod-shaped articles to be conveyed by said second conveyor means.

3,854,568

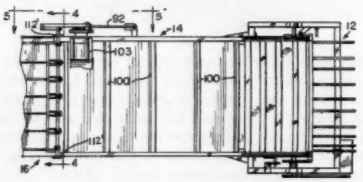
ARTICLE HANDLING APPARATUS

Charles H. Willsey, Topeka, Kans., assignor to Seymour Foods, Inc., Topeka, Kans.

Division of Ser. No. 177,931, Sept. 7, 1971, Pat. No. 3,752,340. This application Mar. 16, 1973, Ser. No. 341,959

Int. Cl. B65g *47/26*

U.S. Cl. 198—30 **5 Claims**



1. In an apparatus for handling eggs or similar articles, a horizontally disposed supporting table member of a length and width sufficient to provide an area for accumulating a substantial quantity of eggs thereon, means for advancing eggs along the surface of said table to said accumulating area which egg advancing means includes egg engaging means operative to normally move the eggs along said table surface and to brush past the eggs when they meet an obstruction, means at the leading end of said accumulating area and depending between the eggs for guiding the eggs into a plurality of laterally spaced lanes and means for imparting sufficient oscillating movement to said table surface in a direction laterally of the path of advance of the eggs to agitate the eggs when they are approaching the entrance to said lanes so as to prevent piling up at the entrance to said lanes and facilitate the entry of the eggs into said lanes.

3,854,569

CONVEYOR SYSTEM FOR MANUFACTURED ARTICLES, PARTICULARLY CONFECTIONS

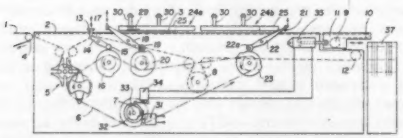
Gilbert Steinhart, Hannover, and Heinrich Bock, Empelde, both of Germany, assignors to Nabisco, Inc., New York, N.Y.

Filed Nov. 21, 1972, Ser. No. 308,428

Claims priority, application Germany, Feb. 9, 1972, 2206137

Int. Cl. B65g *47/26*

U.S. Cl. 198—34 **5 Claims**



1. In a conveyor system of the type having a first conveyor belt movable at a velocity v_1 and adapted to transport irregularly spaced objects, the improvement comprising means for aligning said objects, said means comprising a second conveyor belt positioned to receive said objects from said first belt, means for intermittently operating said second belt, a continuously running third belt having a velocity greater than v_1 and positioned to receive said objects from said second belt, alignment rail means positioned above said third belt, means for periodically moving said rail means to a first position to inhibit movement of said objects on said third belt and moving said rail means to a second position to permit movement of said objects on said third conveyor belt, laterally operative rake means, means for positioning said rake means above said third belt following said rail means, means for periodically operating said rake means for urging objects transversely on said third belt, and frame means for movably supporting said rake means, said rake means comprising first and second rakes spaced apart, in the direction transverse to the direction of movement of said third belt, by a distance substantially equal to one half the width of said third belt.

3,854,570

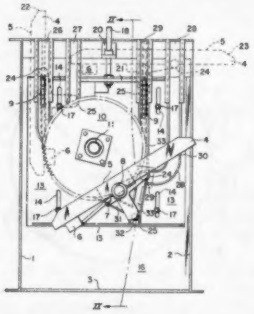
VERTICAL CONVEYOR SHELF TILTING MECHANISM

Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio

Filed Apr. 20, 1973, Ser. No. 352,959

Int. Cl. B65g *17/00*

U.S. Cl. 198—158 **12 Claims**



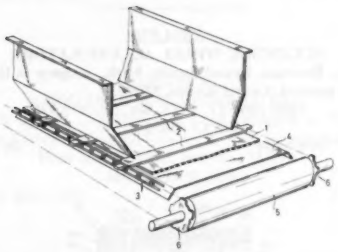
1. A tilting shelf, vertical conveyor, comprising: at least one rotatably mounted sprocket wheel having a generally horizontal axis of rotation; an endless chain in driving interengagement with said sprocket wheel and being guided to have a first generally vertical conveyor run on one side of said sprocket wheel and a second generally vertical conveyor run on the opposite side of said sprocket wheel; means for driving said sprocket wheel and chain in one conveying direction, with said one conveyor run traveling generally vertically to said sprocket wheel and said second conveyor run traveling generally vertically away from said sprocket wheel; a plurality of shelves having load carrying surfaces; bearing means pivotally mounting each of said shelves on said chain for pivotal movement about respective generally horizontal axes; each of said shelves having a first guide roller rotatable about an axis parallel to the axis of pivoting for said bearing means and said sprocket wheel axis, and a second guide roller rotatable about an axis parallel to said axes; the axes of rotation of said first guide roller and said bearing means lying within a plane intersecting the plane having therein the axes of rotation of said second guide roller and said bearing means; first and second stationary guide channels generally parallel to each other and extending along one of said conveyor runs, and respectively guidingly receiving therein said first and second guide rollers; said first and second guide rollers, and said first and second guide channels together constituting means holding said shelves with their load carrying surfaces in one of a generally vertical position and a generally horizontal position during movement along said one of said conveyor runs; third and fourth stationary guide channels generally parallel to each other and extending along the other of said conveyor runs, and respectively guidingly receiving therein said second and first

guide rollers; said third and fourth stationary guide channels and said first and second guide rollers together constituting means holding said shelves with their load supporting surfaces in the other of a generally vertical position and a generally horizontal position during movement along said other of said conveyor runs; said first, second, third, and fourth stationary guide channels being so arranged that said first guide roller must cross over said third stationary guide channel to reach said fourth stationary guide channel; first stationary transition guide channel means extending from the cross-over point of said third guide channel to and in alignment with the adjacent end of said fourth guide channel for receiving said first guide roller after it has crossed over said third guide channel and for guiding said first guide roller into said fourth guide channel; second stationary transition guide channel means having a first channel portion guidingly receiving therein said second roller as said first roller approaches said cross-over, a second channel portion guidingly receiving therein said second roller as said first roller crosses over said third guide channel, and a third channel portion receiving therein said second roller as said first roller moves within said first transition guide channel means; said first, second and third channel portions defining a generally cusp-shaped path of travel for said second guide roller as said bearing means travels in an arcuate path concentric with said sprocket and said shelf is tilted to said other position; said second stationary transition guide channel means positively controlling the tilting of its shelf to cause said first guide roller to approach said third guide channel, cross over said third guide channel, and move over and into said first stationary transition guide channel means; and said first, second and third channel portions being uninterrupted with respect to each other.

3,854,571
SCOOP BELT CONVEYOR

Esko Eemeli Siirtola, 39700 Parkano, Finland

Filed Oct. 20, 1972, Ser. No. 299,309
Claims priority, application Finland, Oct. 27, 1971, 3045
Int. Cl. B65g *15/10*
U.S. Cl. 198—162 **1 Claim**



1. An endless belt conveyor for transporting material comprising

a stationary sliding base having a smooth upper surface,

a shaft,

sprocket wheels secured to said shaft for rotation therewith,

a drum mounted for free rotation on said shaft between said sprocket wheels,

an endless belt having one run thereof supported on said stationary sliding base and trained about said drum,

parallel spaced chains driven by said sprocket wheels and a plurality of transversal conveying means fixed between said chains for movement thereon moving over said one run;

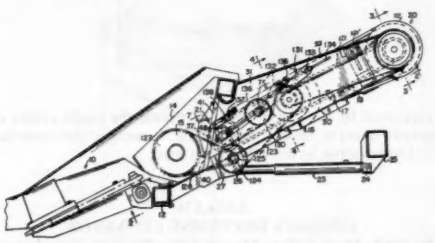
and driving means operatively connected to said chain conveyor;

the material to be transported being carried on the endless belt with its weight supported by the stationary sliding base and said endless belt being carried along by the material being transported.

3,854,572
CORN HEADER WITH AUTOMATIC TENSIONING OF FEEDER CHAINS

Arved Maiste, Brantford, Ontario, Canada, assignor to White Motor Corporation of Canada Limited, Brantford, Province of Ontario Dominion, Canada

Filed Sept. 25, 1972, Ser. No. 291,895
Int. Cl. B65g *19/00*
U.S. Cl. 198—174 **1 Claim**



1. In apparatus for feeding crop material rearwardly and upwardly from a crop gathering head for a combine into the combine, said apparatus comprising, a housing having a floor, top and side walls and adapted to be mounted in inclined relation at the forward end of the combine, said housing being adapted to have its lower end connected in crop receiving relationship with said crop gathering head and its upper end connected in crop delivering relationship with said combine, and a feeder chain conveyor mounted in said housing and having a lower run which is operative to advance the harvested material upwardly along the floor of said housing, said chain conveyor having its upper end mounted on a top shaft assembly, power receiving means on said top shaft assembly for receiving power to drive said conveyor, and said conveyor having its bottom end mounted on an idler shaft assembly; the improvement comprising means mounting said idler shaft assembly for allowing limited movement thereof in a direction toward and from the floor of said housing and means for biasing said idler shaft assembly forwardly toward a downward position, said means for mounting said bottom idler shaft assembly comprising a cross shaft having its ends extending outside of the housing side walls through accommodating apertures therein, bearing members on the ends of said shaft, support arms pivotally mounted exteriorally on said housing side walls, said bearing members being movably mounted on said support arms and resilient means for urging said bearing members in a direction to automatically tension the conveyor chains and to urge said bearing members in the direction of the floor of said housing.

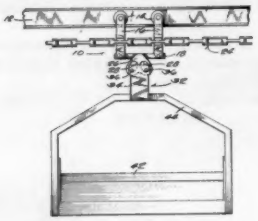
3,854,573
LOAD CARRIER WITH DUAL PIN SUSPENSION

Gerald W. Freier, Sr., Neenah, Wis., assignor to Neenah Foundry Company, Neenah, Wis.

Filed July 30, 1973, Ser. No. 384,153
Int. Cl. B65g *17/20*
U.S. Cl. 198—177 R **12 Claims**

1. In a suspension system for suspending a load carrier from an overhead trolley having a load carrier supporting member, the improvement in which said load carrier is provided with two pintles spaced apart from each other longitudinally of, and at the top of, the load carrier and spaced inwardly from the ends of the load carrier so that the center of gravity of a load carried by the load carrier can be located between said pins and an end of the load carrier, said supporting member having a surface for receiving and supporting said pintles, there being an open space in said supporting member above

each of the pintles so that each pintle can be lifted off its supporting surface, whereby an unbalanced load so located in said load carrier causes the load carrier to tilt so that it is



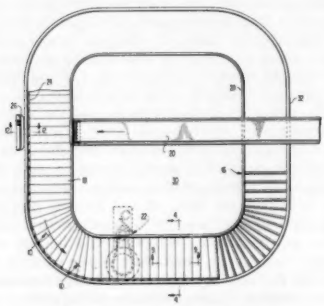
supported by the pintle which is nearest the load's center of gravity, thereby reducing the tilting moment of the load carrier in response to an unbalanced load.

3,854,574

LUGGAGE DISPENSING CONVEYOR

Frederik Theijsmeijer, Elwood City, Pa., and Bert Krivec, Waukesha, Wis., assignors to Rexnord Inc., Milwaukee, Wis.

Filed May 29, 1973, Ser. No. 364,473
Int. Cl. B65g *15/00*
U.S. Cl. 198—181 **19 Claims**



1. In a conveyor useful for handling luggage to be claimed and having an inclined conveyor surface traversing an endless non-circular path, the conveyor being of the type having a plurality of interconnecting inclined flights with relatively slideable plates moving together along the path and supported by rollers from inside and outside rails, an endless chain connected to the flights for moving the flights, the chain being guided around the outside periphery of the path and attached to the outer end of each flight, the improvements comprising: a large diameter sprocket wheel with cycloidal teeth mounted on a stationary stub shaft and contacting rollers of the chain on a straight portion of the chain path, motor means positioned within the path and connected by power transmission means to drive the sprocket wheel, and each flight further comprising;

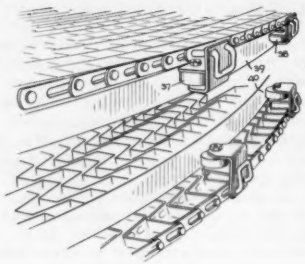
a structural flight support rib extending the length of each flight and attached to the chain at a roller thereof, the chain having a substantially smaller pitch than the flight support rib, and each plate for each flight having a single longitudinal bend so that the free exposed edge of each plate is positioned more closely adjacent the surface of the adjacent plate that it overlaps, and means for rigidly attaching each plate to the support rib.

3,854,575

CONVEYOR BELT SYSTEM

Joseph Fraioli, Sr., 300 Martine Ave., White Plains, N.Y. 10603

Filed Oct. 30, 1973, Ser. No. 411,082
Int. Cl. B65g *15/00*
U.S. Cl. 198—182 **5 Claims**



1. An endless chain belt conveyor system for transporting articles along an arcuate path, said system comprising:

A. a trackway extending along said arcuate path and having an outer rail formed by a curved strip,

B. an endless belt movable along said trackway and capable of turning to follow said path, the outer margin of said belt overhanging said rail and riding thereon, and

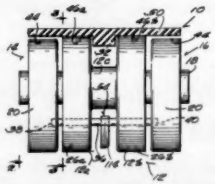
C. roller mounted on the underside of the overhang of said belt at spaced positions therealong, the upper side of the overhang being free of obstruction to provide an uninterrupted belt surface which may be lifted relative to said rail, said rollers engaging and rolling along the outer surface of said rail and being tracked thereby whereby the stresses imposed by said belt in the course of turning movement are distributed along said rail which also functions as a bed for said belt.

3,854,576

ECCENTRIC WHEEL ACCUMULATORS

Clyde L. Bowman, Grand Rapids, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed June 27, 1973, Ser. No. 373,928
Int. Cl. B65g *15/00*
U.S. Cl. 198—184 **26 Claims**



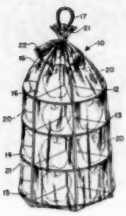
1. A cam roller means for supporting a propelling member in both a raised and lowered position comprising first and second eccentric rollers mounted coaxially, and rotatable relative to each other between a lowered position wherein the portions of least radius of said rollers are in phase with each other and supporting said propelling member in its lowered position and a raised position wherein the portions of least radius of said rollers are out of phase with each other forming a circular roller means supporting said propelling member in its raised position.

3,854,577

PACKAGE AND CENTER-PIECE

Henry J. DuMolin, Rt. 1, Hwy. 23, Port Sulphur, La.

Filed Apr. 4, 1972, Ser. No. 241,032
Int. Cl. B65d 65/16, 77/26; A47b 47/00
U.S. Cl. 206—45.33 4 Claims



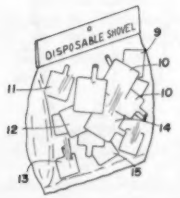
1. A package and center-piece for packing and ornamental display of contents individually and by grade sizes comprising in combination: a plurality of horizontal members each defining a plurality of slots equally spaced around the perimeter of each said horizontal member, and extending inward for less than a quarter of the distance between opposite points on each said perimeter; a plurality of vertical members, each having the same plurality of vertically spaced parallel slots as there are horizontal members for association therewith and each slot extending for a quarter of the distance between opposite points on the perimeter of the associated horizontal member, the slots of said horizontal members and the slots of said vertical members interfitting and forming vertical tiers of side-opening cubicles to receive, support and display said contents; and a clear plastic bag open at an end and enclosing said interfitting members, said open end being tied at the top thereof for the retention of contents therein in visible ornamental display.

3,854,578

DOG DROPPING DISPOSAL KIT

Grace S. Sharpe, San Francisco, Calif., assignor to The Raymond Lee Organization, New york, N.Y., a part interest

Filed May 7, 1973, Ser. No. 357,913
Int. Cl. B65f 1/06
U.S. Cl. 206—223 3 Claims



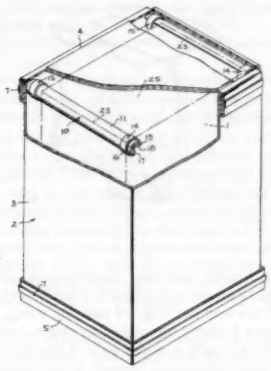
1. A dog dropping disposal kit, comprising
a bucket;
a plurality of disposable liners for the bucket;
a shovel stick; and
a plurality of disposable shovel heads each adapted to be removably affixed to the stick.

3,854,579

PACKAGED ARTICLE INCLUDING BLOCKING AND CUSHIONING MEANS

Edward W. Scharre, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 186,923, Oct. 6, 1971,. This application Jan. 29, 1973, Ser. No. 327,789
Int. Cl. B65d 81/06, 85/30, 5/50
U.S. Cl. 206—320 7 Claims



1. An edge and corner blocking member for protectively packaging a top edge and adjacent corners of a rectangular article in spaced relationship to the adjacent inner surfaces of a rectangular container, said top edge and corners of the container being defined by intersecting walls and top of said rectangular article, comprising:
an elongated pad having ends, an axis, a semi-cylindrical portion having first and second ends and extending along the axis for engaging adjoining side and top wall surfaces of the container in the installed position and a pair of integral wing cushioning portions for resiliently contacting and supporting intersecting side and top wall surfaces forming said edge of said rectangular article, each of said wing cushioning portions having a first edge hingedly connected to the first edge of the respective semi-cylindrical portion and a second edge positioned adjacent and directed toward the concave surface of said semi-cylindrical portion;
a pair of cylindrical blocking collars each having inner and outer edges, an axis, and an opening extending axially therethrough, said pad extending through the collar openings with each collar being positioned adjacent and spaced from a respective pad end and with the inner edges of each collar substantially engaging an opposed wall of said article in the installed position; and
fastening means for pivotally connecting each collar to the pad for pivotal movement of the collar relative to the axis of the pad.

3,854,580

CARRIER FOR TUMBLERS, GOBLETS AND THE LIKE

Russell J. Hennessey, St. Paul, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

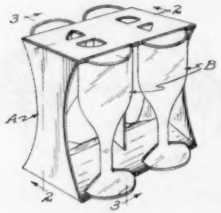
Filed Nov. 17, 1972, Ser. No. 307,653
Int. Cl. B65d 5/04
U.S. Cl. 206—426 4 Claims

1. A carrier for at least a pair of objects, the upper ends of which are substantially hollow and cylindrical, the carrier being formed of paperboard, the carrier including:
horizontal top and bottom panels and vertical side wall panels hingedly connected to the top and bottom wall to form a carrier sleeve,

a reinforcing flange secured to one edge of said top panel and folded into face contact with the under surface thereof,

a flap hingedly connected to the inner edge of said reinforcing flange and inclining inwardly and downwardly therefrom,

means connecting said top and bottom panels engaging said flap to hold the same in inclined position,



said flap having apertures therethrough defining edges adapted to engage said objects to limit movement thereof away from said one edge of said top panel,

locking tabs foldably connected to said top panel and foldable into the hollow upper ends of the objects to restrain them from movement thereof in an outward direction toward said one edge, and

means on said bottom panel adapted to engage with the lower ends of said objects to hold them restrained.

3,854,581

PRESSURE-SENSITIVE MATERIAL AND SUPPORTING MATERIAL COMBINATION

Ernest Charles Jones, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 10, 1972, Ser. No. 242,465

Int. Cl. B32b *5/18*; **G09f** *3/00*

U.S. Cl. 206—460 **4 Claims**

1. A tamper-indicating label construction, comprising: a longitudinally extending web of supporting material, label material having a coating of pressure-sensitive adhesive releasably securing the label material to the supporting material, and cuts through the label material at longitudinally spaced apart intervals defining labels, the label material comprising extruded, foamed, stretched, uniaxially oriented polyolefin film which tears readily longitudinally and wrinkles transversely, wherein the polyolefin film comprises polypropylene, the labels being capable of being removed from the supporting material and applied to articles but providing a telltale indication of tampering by tearing longitudinally and/or by wrinkling transversely if attempted to be removed.

3,854,582

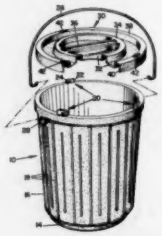
CLOSURE AND CONTAINER

Arnold C. Martinelli, Lake Shore Dr., Rawdon, Quebec, Canada

Filed Apr. 17, 1973, Ser. No. 351,953

Int. Cl. B65d *21/02*, *41/06*, *25/28*

U.S. Cl. 206—508 **1 Claim**



1. In combination, an open topped container and a closure therefor, locking lugs on the container registrable with locking slots in the closure and selectively movable out of such registration for locking the closure relative to the container, a stacking ring depending from the bottom wall of the container and a mating stacking ring extending upwardly from the closure, whereby a plurality of containers may be stacked one upon the other when the closure is in place on the open end of the container, the locking lugs on the container comprising a web portion fixed to and extending upwardly from the upper end of the container and a locking bar extending outwardly from the upper end of the web portion in spaced parallelism to the upper end of the container, a handle on the closure for facilitating its movement, and stacking ribs on the exterior side walls of the container, wherein the closure upon removal from the upper end of the container and placement on the ground or other supporting surface may function as a base or pedestal for the container, with the stacking ring of the container being engaged with the stacking ring of the closure.

3,854,583

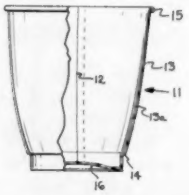
NESTABLE FABRICATED THERMOPLASTIC CONTAINER AND METHOD OF FABRICATION SAME

Stephen W. Amberg, Saint James, and Thomas E. Doherty, Setauket, both of N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 23, 1971, Ser. No. 211,259

Int. Cl. B65d *21/02*

U.S. Cl. 206—520 **18 Claims**



1. A two-piece nestable cup-like container comprising, in combination: a sidewall formed from a single double-ended sheet of a heat-shrinkable thermoplastic material, and having an inner surface adapted to contact a liquid product to be contained in said container, the ends of said sheet being joined to one another to form a liquid-tight seam extending from the top to the bottom of said container, said container having a mouth at its top which is defined by the upper portion of the sidewall, said upper portion being reversely folded into a

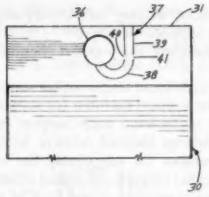
relatively thin tight bead which surrounds said mouth, said sidewall continuously and progressively tapering inwardly and downwardly from a point near the open mouth of the container to a point near the bottom of the container for a major portion of the height of the container, the height of said major portion constituting substantially more than one-half of the height of said container, the thickness of the sidewall increasing continuously and progressively over said major portion from a lesser thickness at the top to a greater thickness at the bottom thereof; and a piece separate from the unitary sidewall and sealingly joined thereto for closing the bottom of the container in a liquid-tight manner.

3,854,584

PACKAGE HAVING CONVERTIBLE HEADER FOR HANGING

Elmer I. Olson, Golden Valley, Minn., assignor to Durkee-Atwood Company, Minneapolis, Minn.

Filed July 30, 1973, Ser. No. 383,825
Int. Cl. B65d *5/44*
U.S. Cl. 206—527 **10 Claims**



1. A package for containing merchandise having a convertible header for suspending the package for storage and display, said header comprising a piece of at least semi-rigid sheet material connected to said package adjacent the edge thereof and characterized by:

A. an opening in said header spaced from the top edge thereof and adapted to engage the elongated generally horizontal hanger support of a display rack,

B. a punch-out section in said header bounded by a pair of spaced apart weakened borders extending from the lower portion of said opening to a free edge of the header, and

C. said punch-out section being easily severable from the header to produce a channel in the header between said spaced apart borders,

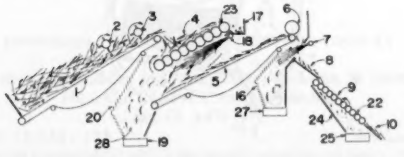
whereby said header is convertible for hanging from either hook-type or closed loop-type hanger supports.

3,854,585

CLEANING APPARATUS FOR MACHINE HARVESTED SUGAR CANE

John W. Herkes, 425 High St., Wailuku, Hawaii 96793

Filed Feb. 28, 1973, Ser. No. 336,414
Int. Cl. B07b *9/00*
U.S. Cl. 209—3 **6 Claims**



1. Apparatus for cleaning machine harvested sugar cane comprising:

a. a first inclined elevating conveyor having a power drive means operatively connected to the conveyor to discharge from the upper end materials placed on the lower end;

b. a material thickness control means operatively connected to the first inclined conveyor to limit the thickness of the blanket of material being discharged;

c. a mechanical screening device comprised of a multitude of toothed rollers having support means holding the rollers in a parallel spaced relationship on an incline with its lower end positioned to receive material discharged from the first conveyor and having drive means operatively connected to the rollers to rotate the rollers in a direction to both pull material through the space between rollers and to spread material on up the incline;

d. a rock receiver at one end of said mechanical screening device;

e. a second inclined elevating conveyor having a supporting means holding the second conveyor in a position generally parallel in inclination with and below the mechanical screening device, said second elevating conveyor being longer than said screening device with the upper end of the second conveyor being out from under the mechanical screening device and having a power driving means operatively connected to the conveyor to discharge materials deposited thereon from the upper end;

f. a cross flow cutter operatively connected to and above the upper portion of the second elevating conveyor and in spaced relationship therewith so as to cut long cane stalks into short lengths for discharge from the second conveyor; and

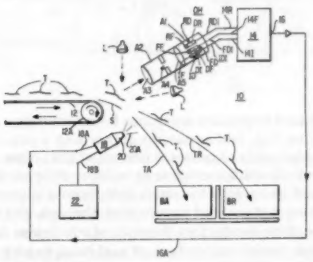
g. a material separating device comprising a series of parallel spaced generally horizontal pocketed rolls, a receiving plate, a waste receiver, a supporting means positioning the receiving plate and pocketed rollers on an incline with the receiving plate interposed on the incline between the discharge end of the second conveyor and the pocketed rolls to direct material discharged from the second conveyor onto the pocketed rollers and supporting the waste receiver beneath the pocketed rollers and driving means operatively connected to the pocketed rolls to rotate the rolls in a direction opposing the flow of material down the incline such that extraneous material caught in the pocketed surfaces will be carried up and over each roll and dropped beneath the rolls into the waste receiver with the clean cane stalks sliding down over the pocketed rolls for discharge separately from the extraneous material.

3,854,586

AUTOMATIC GRADER FOR SORTING OBJECTS ACCORDING TO BRIGHTNESS AND COLOR TONES

Joseph R. Perkins, III, Burke, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed May 15, 1973, Ser. No. 360,570
Int. Cl. B07c *5/342*
U.S. Cl. 209—111.6 **82 Claims**



1. Transducer means determining the relative brightness and color tones of articles to predetermined standards and classifying same into categories comprising:

a background surface having a predetermined color;

source means impinging polychromatic light on the obverse face of said background surface to reflect light therefrom in both the presence and absence of articles on said obverse face;

detector means receiving reflected light from said obverse face in first, second and third bands of the spectrum and producing, for each band, first output parameters representative of the respective intensities of reflected light in each said band in the presence of an article on said obverse face of said background reference;

reference means storing a second parameter for each band representative of the intensity of reflected light in each band in the absence of an article over said obverse face;

differential means operating on said parameters and producing, for each band, a third parameter representing the magnitude of the difference of said first and second parameters;

means modulating said third parameter for each band to vary the magnitude thereof by predetermined interrelated scalar multipliers;

summing means operating on said modulated third parameters and producing the sum thereof;

control means providing, as said predetermined standards, comparison parameters defining divisions of relative brightness and color tones, said divisions defining a plurality of quality zones of known color characteristics for which said articles might qualify;

selection means designating said zones as acceptable and unacceptable;

comparison means comparing said comparison parameters and said sums of said third parameters determining the presence and absence of said articles over said obverse face of said background surface and the zone for which said articles qualify;

and correlating means responsive to said selection means and said comparison means classifying said articles into acceptable and unacceptable categories.

3,854,587

OPTICAL INSPECTION APPARATUS

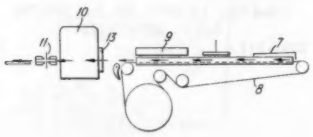
Robert W. McLoughlin, Belfast, and Colin P. Nuttall, Bangor, both of Ireland, assignors to Gallaher Limited, Belfast, Ireland

Filed June 20, 1973, Ser. No. 371,685

Claims priority, application Great Britain, June 29, 1972, 30557/72

Int. Cl. B07c *5/342*

U.S. Cl. 209—111.7 **8 Claims**



1. An optical inspection apparatus for monitoring a continuously moving rod, said apparatus comprising a circular head through which said rod passes, a first set of fibre optic conductors the ends of which terminate at an inner peripheral surface of said head and which transmits light from a source to said head to illuminate said rod passing therethrough, and a second set of fibre optic conductors the ends of which also terminate at said inner peripheral surface of said head to pick up light reflected from said rod passing through said head and transmit said reflected light to a photosensitive element, said second set of conductors being divided into angularly spaced groups around said head and adjacent groups leading to separate photosensitive elements.

3,854,588

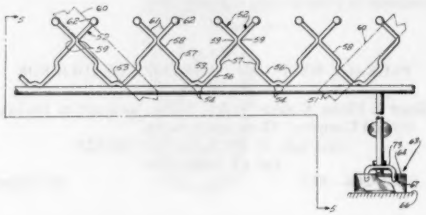
TENNIS RACKET RACK

William C. Kinard, Pasadena, Calif., assignor to Relton Corporation, Arcadia, Calif.

Continuation-in-part of Ser. No. 235,682, March 17, 1972, Pat. No. 3,814,263. This application Feb. 26, 1973, Ser. No. 336,059The portion of the term of this patent subsequent to June 4, 1991, has been disclaimed.

Int. Cl. A47f *7/00*

U.S. Cl. 211—13 **11 Claims**



1. A tennis racket display rack comprising:

an elongated support member;

means for mounting the support member in a horizontal position;

a plurality of individual tennis racket support bays along the length of the support member for supporting the heads of a plurality of rackets, each support bay having racket support portions skewed relative to the length of the support member for supporting the heads of adjacent rackets parallel to each other and offset from each other for exposing a portion of the face of each racket, each support bay being formed by:

the inside of a generally L-shaped bar bonded at the crook of the L to the support member,

a cross-bar on the end of each leg of the L extending generally parallel to the other leg of the L; and

means at the end of each of the cross-bars for inhibiting removal of a racket from the bay unless it is partly lifted from a display position within the bay.

3,854,589

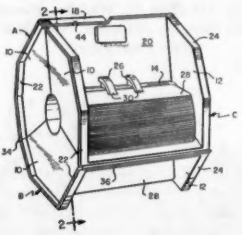
INDEX CARD HOLDER

Ira Saltz, Greenlawn, N.Y., assignor to Oxford Pendaflex Corporation, Garden City, N.Y.

Continuation-in-part of Ser. No. 183,131, Sept. 23, 1970, Pat. No. 3,710,487. This application Jan. 11, 1973, Ser. No. 322,625

Int. Cl. A47f *7/16;* **B65d** *1/22*

U.S. Cl. 211—45 **8 Claims**



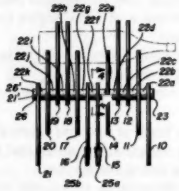
1. An index card holder comprising at least a first cradle-like sector and a second cradle-like sector, each of said sectors being open ended and having a first faceted side wall and a

second faceted side wall, a core sector extending between said side walls, a first end wall and a second end wall extending radially from said core sector, each of said side walls having at least one flat surface, the flat surfaces of opposing side walls being aligned to provide a supporting surface for the card holder; means for detachably and hingedly connecting said sectors at the outermost ends of their adjacent end walls whereby said sectors may be in a closed position, resulting in an endless arrangement of said sectors, and alternatively, whereby said sectors may be in an open position, resulting in a linear arrangement of said sectors; and alternatively, whereby said sectors may be separated from one another into a detached position, each of said sectors being open ended in said open position, said closed position and said detached position, said means for detachably and hingedly connecting said sectors being integral with said sectors, a card mounting rail extending from said first end wall to said second end wall in said first and second sectors.

3,854,590
WINE RACK

John Topping Dolby, Winnetka, Ill., assignor to John T. Dolby and David M. Bender, both of Chicago, Ill.

Filed Nov. 20, 1972, Ser. No. 307,938
Int. Cl. A47b *73/00, 69/00;* **A47g** *23/02*
U.S. Cl. 211—74 **9 Claims**



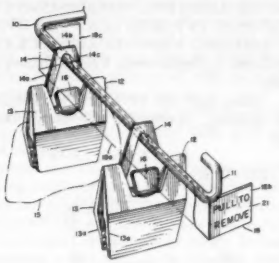
1. A wine bottle rack comprising:
a rod;
a plurality of circular, disk-like plates disposed in a fixed, spaced relation along said rod, each of said plates having a first and second bottle aperture therein of sufficient size to accommodate a bottle to be stored therein;
said plates being disposed in helical relation on said rod; and,
means for aligning said plates in said fixed, spaced relation whereby a second bottle aperture of a first plate is aligned concentrically with a first bottle aperture of a second plate, to bound and form thereby a common aperture suitable for use as a bottle storing space.

3,854,591
DISPOSABLE HANGER RETAINER FOR DISPLAY RACKS

Richard D. Schuessler, 564 Meadow Rd., Winnetka, Ill. 60093

Filed Apr. 26, 1973, Ser. No. 354,856
Int. Cl. A47f *7/19*
U.S. Cl. 211—123 **16 Claims**

1. In combination with a horizontal support rod and a plurality of article-supporting hangers suspended in parallel therefrom, each of said hangers having a hook portion hooked over said rod and having a body portion directly therebelow defining a space therebetween, said hook portion having a free end disposed above said body portion a vertical distance less than the maximum vertical dimension of said space, wherein the improvement comprises an elongated locking strip of flexible material extending through the spaces beneath the hook portions of all of said hangers, said strip having an upper longitudinal edge engaging the underside of said hook portion and a lower longitudinal edge engaging said body portion of said hanger, whereby, said strip restrains each of said hangers from being unhooked from said support rod, said strip slidably

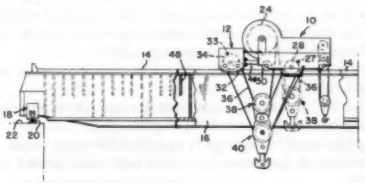


engaging said hook and body portions and being removable by longitudinally sliding said strip out from beneath the hook portion of all of said hangers, the distance between the upper and lower longitudinal edges of said strip exceeding the vertical distance between the free end of said hook portion and said body portion, said body portion of said hanger being provided with an upwardly facing recess, and said lower longitudinal edge of said strip being received within said recess and being restrained thereby against lateral movement.

3,854,592
VARIABLE CAPACITY CRANE HOIST

Sigurd C. Mordre, Dockton, Wash., assignor to Ederer Incorporated, Seattle, Wash.

Filed May 25, 1973, Ser. No. 364,109
Int. Cl. B66c *17/00*
U.S. Cl. 212—11 **10 Claims**



1. A convertible crane suitable for large-capacity temporary use and long-life, lower capacity ordinary use comprising primary support means movable along a horizontal surface and carrying powered hoist means for lowering and and raising a line, means on said primary support means for propelling the primary support means along said horizontal surface, said hoist means being designed for ordinary use substantially less than the capacity for said temporary use, and secondary support means on said horizontal surface for supporting auxiliary sheave means for receiving said line, movement of said primary and secondary support means along said horizontal

surface being powered by said propelling means on said primary support means and traveling block means for receiving said line from said hoist means and said auxiliary sheave means and adapted to be connected to a load whereby the combined primary and secondary support means increases the load capacity of the crane to said large capacity for temporary use but without substantially increasing the size of the primary support means and powered hoist means.

3,854,593

OVERLOAD SWITCH-OFF DEVICE FOR HYDRAULIC LIFTING OR ADJUSTING MECHANISMS CONNECTED IN TANDEM, IN PARTICULAR FOR HYDRAULIC LOADING AND UNLOADING CRANES

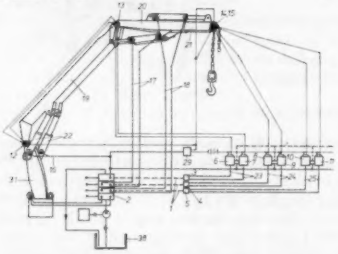
Siegfried Gross, 7, Rotdornweg, 4935 Hiddesen near Detmold, Germany

Filed Sept. 19, 1972, Ser. No. 290,297

Claims priority, application Germany, Dec. 24, 1971, 2164628

Int. Cl. B66c *13/48*

U.S. Cl. 212—39 R **3 Claims**



1. An overload switch-off arrangement for hydraulic loading and unloading cranes comprising a plurality of jib arms connected in tandem for relative movement with respect to each other; a plurality of hydraulic actuating means, each associated with adjacent jib arms, for moving said adjacent jib arms relative to each other; a plurality of hydraulic conduit means, each connected to one of said hydraulic actuating means for conducting hydraulic fluid to and from each of said actuating means; and a plurality of main control valves, each connected to one of said hydraulic conduit means for controlling hydraulic fluid flow therethrough; said overload switch-off arrangement comprising:

a. a pressure-sensitive switch in at least one of said conduit means and sensitive to a predetermined maximum hydraulic pressure,

b. a plurality of switches, each associated with adjacent sets of said jib arms and arranged to be actuated when said adjacent sets of jib arms are moved to obtain a predetermined position relative to each other,

c. a plurality of valve means, each associated with one of said switches,

d. means operatively connecting said pressure-sensitive switch, switches and valve means,

e. a plurality of hydraulically operated blocking valves, each operatively connected to one of said main control valves, and

f. a plurality of further hydraulic conduit means, each extending between one of said valve means and one of said blocking valves,

g. whereby an overload is detected by at least one of said valve means when actuated by closure of said pressure-sensitive switch and at least one of said switches associated with adjacent sets of said jib arms, and the associated blocking valve is actuated closing the associated main control valve, interrupting the supply of hydraulic fluid to one of said hydraulic actuating means, and those operations of the jib arms attending to increase the overload are blocked, while those operations of the jib arms tending to reduce the overload are permitted.

3,854,594

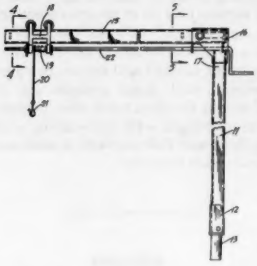
COLLAPSIBLE HOISTING APPARATUS

William Ronald Brookes, Regina, Saskatchewan, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 26, 1973, Ser. No. 419,202

Int. Cl. B66c *23/06*

U.S. Cl. 212—56 **3 Claims**



1. Collapsible hoisting apparatus, comprising

an upright member having a shoe at one end and a swivel pin mounted in the shoe and adapted to pivotally seat in a socket;

a boom;

a boom head affixing one end of the boom to the other end of the upright member for rotation from a position in which the boom is parallel to the upright member in the plane of the boom and the upright member to a position in which the boom is at right angles to the upright member in said plane;

trolley means movably mounted on the boom for movement along the length thereof;

cable winding means rotatably mounted on the trolley means;

a cable having a hook at one end thereof and affixed to the cable winding means at the other end thereof and wound on the cable winding means; and

turning means coupled to the cable winding means and extending beyond the boom head for selective manual winding and unwinding of the cable.

3,854,595

MOBILE CRANE

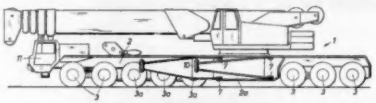
Eberhard Kuhn, Hochdahl, Germany, assignor to Demag Baumaschinen Gesellschaft mit beschrankter Haftung, Dusseldorf, Germany

Filed Dec. 3, 1973, Ser. No. 421,503

Claims priority, application Germany, May 4, 1973, 2322383

Int. Cl. B66c *23/62*

U.S. Cl. 212—145 **7 Claims**



1. A mobile crane or like vehicle having a chassis of predetermined width and two pairs of outrigger arms pivotable laterally outwardly to increase the support basis of the vehicle foldable back into the chassis for transport of the vehicle, characterized in that

a. a plurality of wheel supporting first axles are mounted on said chassis, the forwardmost and rearwardmost of said first axles having a first predetermined length generally equal to the width of said chassis;

b. a plurality of wheel supporting second axles of a second

predetermined length, smaller than said first predetermined length, mounted on said chassis between said first axles;

c. means mounting said outrigger arms to said chassis adjacent said second axles of smaller length, whereby said outrigger arms are nested within the chassis vehicle width and in juxtaposition to wheels supported by said second axles when said arms are folded against the chassis for vehicle transport.

3,854,596

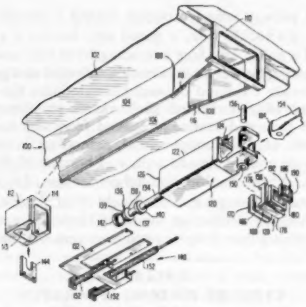
RAILWAY UNIT CUSHIONING APPARATUS

Jack G. Stephenson, and John E. Mosier, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 327,997, Jan. 30, 1973,. This application Jan. 16, 1974, Ser. No. 433,857

Int. Cl. B61g *9/16*

U.S. Cl. 213—8 **17 Claims**



1. A railway unit cushioning apparatus comprising:

sill means directly connectable to and generally longitudinally alignable with a railway unit underframe and including,

a first side wall operable for normally projecting downwardly from the railway unit underframe,

a second side wall operable for normally projecting downwardly from the railway unit underframe and extending in a spaced parallel posture coextensively with said first side wall

wherein the improvement comprises:

buff backstop means operable for normally projecting downwardly from the railway unit underframe and extending between said first and second side walls at the buff end thereof;

draft stop means connected within said sill means to the draft end of said first and second side walls of said sill means;

cushioning housing means positioned within said sill means for operative translation between said buff backstop and said draft stop means, said cushioning housing having a barrier transversely extending intermediate the ends thereof,

said transverse barrier, in combination with said cushioning housing means, defining one one side a mechanical cushioning cavity at the draft end of said housing,

said transverse barrier, in combination with said cushioning housing means, defining on the other side thereof an hydraulic cushioning cavity at the buff end of said housing, wherein said hydraulic cushioning cavity is longitudinally aligned with respect to said mechanical cushioning cavity,

said mechanical cushioning cavity being further defined by inwardly extending retainer means at the draft end of said cushioning housing means, and

said hydraulic cushioning cavity being further defined by wall means transversely extending across the buff end of said cushioning housing means;

mechanical cushioning means extending within said mechanical cushioning cavity between said transverse barrier and said inwardly projecting retainer means for cushioning both buff and draft forces, and including

follower means positioned within said mechanical cushioning cavity adjacent said retainer means,

elastomeric cushioning means extending between said transverse barrier and said follower means, and

spacer means at least partially coaxially surrounding said cushioning means and having an axial dimension less than the axial dimension of said cushioning means such that said cushioning means may be compressed until said follower means goes solid with said transverse barrier through said spacer means;

hydraulic cushioning means extending within said hydraulic cushioning cavity for cushioning both buff and draft forces and including,

cylinder means coaxially extending within said hydraulic cushioning cavity between said transverse barrier and said wall means whereby a high pressure fluid cavity is formed within the interior of said cylinder means and a relatively lower pressure fluid cavity formed within said hydraulic cushioning cavity coaxially surrounding said cylinder means,

piston means received for translation within said cylinder means between said transverse barrier and said wall means,

a piston rod connected at one end to said piston means within said cylinder means and translatably extending through said wall means,

anchoring means positioned within said buff backstop means for anchoring the other end of said piston rod in a fixed longitudinal posture with respect to said sill means,

means for permitting the passage of fluid from said low pressure fluid cavity to said high pressure fluid cavity at either end of said cylinder means while simultaneously preventing the flow of fluid from said high pressure fluid cavity to said low pressure fluid cavity,

means for permitting the flow of fluid from said high pressure fluid cavity to said low pressure fluid cavity, with a first impedance in response to coupling force induced relative movement of said piston means within said cylinder means, and with a second impedance greater than said first impedance in response to run-in train action force induced relative movement of said piston within said cylinder means, and

coupler bar means connected to the draft end of said cushioning housing means,

said coupler bar means being operable in response to buff forces to transmit said buff forces through said mechanical cushioning means and into said cushioning housing means and effect actuation of said hydraulic cushioning means until said cushioning housing goes solid with said buff backstop means and into said mechanical cushioning means to effect compression of said elastomeric cushioning means until said spacer means goes solid with said transverse barrier of said cushioning housing means; and

said coupler bar means being further operable in response to draft forces to transmit draft forces into said cushioning housing means and effect actuation of said hydraulic cushioning means until said follower plate of said mechanical cushioning means goes solid with said draft stop means and into said mechanical cushioning means to effect actuation of said elastomeric cushioning means until said spacer means goes solid with said transverse barrier of said cushioning housing means, and

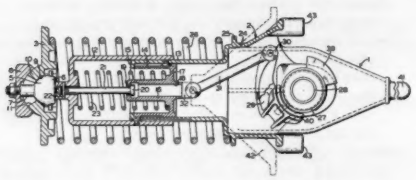
means connected to said cushioning housing means for biasing said cushioning housing means toward the draft end of said sill means.

3,854,597

AUTOMATIC HOSE CONNECTOR FOR RAILWAY CARS

Glenn T. McClure, McKeesport, and William K. Mong, Irwin, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed July 30, 1973, Ser. No. 383,524
Int. Cl. B61g 5/08
U.S. Cl. 213—76 9 Claims



1. An automatic hose connector for a railway car having a car coupler at one end thereof for coupling to a counterpart car coupler of an adjacent car and a train line hose for connection to a counterpart train line hose on the adjacent car, said automatic hose connector comprising:

a. a mating head having rotatably mounted thereon the connecting end of the train hose of the respective car;

b. support spring means for flexibly supporting said mating head on the car coupler in an axially aligned position for coupling with a counterpart mating head carried by the counterpart car coupler; and

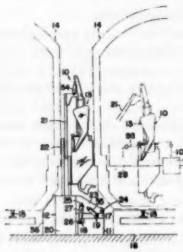
c. operating means operable responsively to coupling action of said mating head with the counterpart mating head for effecting rotation of the connecting end of the train line hose in one rotational direction from a disengaged position to an engaged sealing position with the connecting end carried by the counterpart mating head.

3,854,598

AUTOMATIC UNLOCKING DEVICE FOR ROLLING STOCK COUPLERS

Shigezo Yamazaki, Tokyo; Mitsuru Wakao, Iwatsuki, and Kenichi Inami, Kawasaki, all of Japan, assignors to Japanese National Railways and Kayabakogyokabushikikaisha, both of Tokyo, Japan

Filed Jan. 28, 1974, Ser. No. 437,001
Claims priority, application Japan, Jan. 30, 1973, 48-11579
Int. Cl. B61g 7/04
U.S. Cl. 213—211 10 Claims



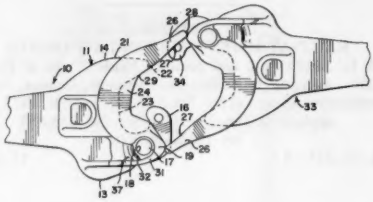
1. An automatic unlocking device for rolling stock couplers, comprising a railway track which carries any rolling stock to be separated, a base stand which is installed on the ground at the railway track side, a boom mechanism which is supported by said base stand tilting freely toward the railway track and incorporating parallel shift links movable along the said railway track, a robot which is hung from said boom mechanism, and lock release devices which are arranged on the robot for unlocking couplers of any rolling stock to be separated when they are travelling on said track.

3,854,599

RAILWAY COUPLER

John Charles Day, Hinsdale, and Carl Edward Tack, Elmhurst, both of Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Dec. 10, 1973, Ser. No. 424,346
Int. Cl. B61g 3/04
U.S. Cl. 213—100 R 7 Claims



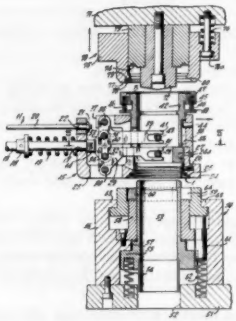
1. In a railway vehicle coupler having a coupler housing including a knuckle side, a guard arm having a guard arm nose, and a guard arm face extending from said nose, a front face extending between said knuckle side and said guard arm, and a knuckle mounted on said knuckle side; the improvement comprising horizontal shelf means projecting beyond said front face and vertically spaced from the longitudinal center line of said coupler and extending between said knuckle side and said guard arm, said horizontal shelf means being spaced from the longitudinal center line of said housing a distance at least as great as the height of said knuckle but not greater than the distance at which said knuckle would fail to couple with another coupler resting on said shelf means.

3,854,600

CLOSURE FEEDING APPARATUS

John Jesevich, Cicero, and Vyto Simkus, Chicago, both of Ill., assignors to American Flange & Manufacturing Co. Inc., New York, N.Y.

Division of Ser. No. 131,258, April 5, 1971, Pat. No. 3,800,401. This application Oct. 25, 1973, Ser. No. 409,390
Int. Cl. B25j 3/00
U.S. Cl. 214—1 BB 4 Claims



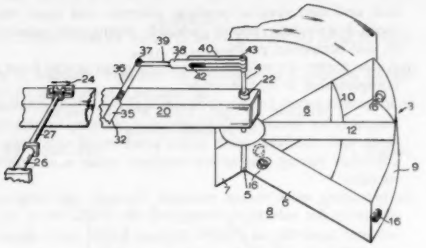
1. Apparatus for simultaneously feeding a closure flange and a tag ring element into an insertion die for securing to a container wall, comprising a horizontally reciprocating drive member operatively connected to said insertion die, drive means connected to the outer end of said drive member, said drive member having an inner end adjacent said die including closure flange supporting means and tag ring element supporting means whereby said drive means acting upon said drive member is adapted to deliver said closure flange and said tag ring element for placement in said insertion die.

3,854,601

APPARATUS FOR FORMING PATTERNED LAYERS

Frank H. Miller, Jr., Louisville, and David L. Witherspoon, Anchorage, both of, Ky., assignors to Miller Engineering Corporation, Louisville, Ky.

Filed July 5, 1973, Ser. No. 376,741
Int. Cl. B65g 57/24
U.S. Cl. 214—6 P 11 Claims



1. A pattern forming device for stacking patterned layers of articles onto a pallet, comprising:

A. an endless conveyor, including a receiving zone for receiving articles, a loading zone comprising an aperture in said endless conveyor through which said articles gravitationally pass onto said pallet, and a fixed stop disposed over the terminal border of said pallet for stopping said articles and to maintain said articles in fixed position for loading onto said pallet through said aperture.

B. the improvement in said pattern forming device of:

1. a first turning station for turning articles clockwise and counterclockwise to both sides of their original line of travel along the long axis of said conveyor so that each turned article lies laterally spaced from the center line of said conveyor and with each turned article's longitudinal axis turned at about **90** degrees from the center line of said conveyor;

2. a pair of second turning stations, one on either side of said conveyor operative to turn articles a second time so that the longitudinal axes of the twice turned articles on one side are parallel and laterally disposed to their original line of travel and normal to the longitudinal axes of the once turned articles on the other side of said conveyor, and,

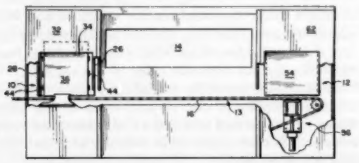
3. a pattern closer and locator for pushing articles on either side of said conveyor together so as to close the pattern and locate a patterned layer of said articles over said pallet.

3,854,602

MAGNETIC HOPPER SYSTEM

Fritz Blank, Miramar, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Aug. 27, 1973, Ser. No. 391,582
Int. Cl. B65g 57/30, 59/06
U.S. Cl. 214—6 BA 8 Claims



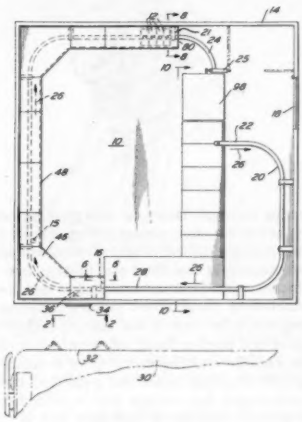
1. In a system for storing elongate objects each having magnetizable material therein and for sequentially moving the objects transversely of the long axis of each object onto a conveyor, a magazine including a generally upright member having means for magnetically holding a plurality of objects thereagainst, deflectable pawls situated adjacent said upright member and deflectable inwardly of said plate, and means for moving said upright member downwardly to move the objects held thereto from an upper position downwardly over said pawls to a lower position and for moving said upright member upwardly as said pawls engage the objects and hold the same in the lowered positions the lowermost position being adjacent the conveyor.

3,854,603

SECURITY SYSTEM AND METHOD FOR VALUABLES

Russell W. Walters, Reading, Pa., assignor to BMR Security Products Corp., Reading, Pa.

Filed Jan. 22, 1973, Ser. No. 325,333
Int. Cl. B65g 1/08
U.S. Cl. 214—16 B 11 Claims



1. The method of collecting and maintaining containers having valuables stored therein in a fixed secure enclosure comprising the steps of:

a. moving a carrier to a loading position accessible through a lockable doorway to the outside of said secure enclosure;

b. mounting a container with valuables stored therein on said carrier;

c. moving said carrier into and through said secure enclosure;

d. stopping said carrier in said secure enclosure in a position remote from and inaccessible to said loading position; and

e. storing said carrier having said container mounted thereon at said remote and inaccessible stopped position within the secure enclosure.

3,854,604

ARTICLE STORAGE AND RETRIEVAL

Charles E. Peterson, Boulder, and Donald W. Schaefer, Lakewood, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 8, 1972, Ser. No. 304,698
Int. Cl. B65g 1/06
U.S. Cl. 214—16.4 A 10 Claims

1. An information document storage apparatus having two spaced-apart parallel-extending facing storage walls each having a multiplicity of open storage compartments, plane travel means extending parallel to and disposed between said storage walls including improved movable means for selec-

tively accessing any of said storage compartments, exchange means accessible by said movable means for exchanging documents with a document handler,

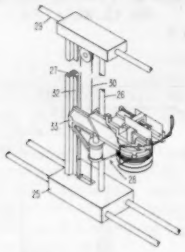
the improved movable means including in combination:

main carriage means including elevator means for two-dimensional movements along a given defined plane in said plane travel means between said walls an elevator support pole on said carriage means;

a frame in said elevator movable along one of said two-dimensional movements along said defined plane and having a portion extending in cantilevered relationship from said elevator support pole;

a platform on said frame;

a pivoting bed having a front end portion on said platform and disposed for pivoting motions transverse to said defined plane;



reciprocating carriage means on said pivoting bed and including article retaining means and reciprocal between a traveling position central of said pivoting bed and a load-/unload position at said front end portion; and

control means on said frame connected to said pivoting bed for establishing plural stable pivoted positions for said pivoting bed, a first one of said stable positions including said front end portion being adjacent a first one of said storage walls for enabling exchange of an article between said article retaining means and a selected storage compartment in said first storage wall, a second one of said stable positions including said first end portion being adjacent a second one of said storage walls for enabling exchange of an article between said article retaining means and a selected storage compartment in said second storage wall.

3,854,605

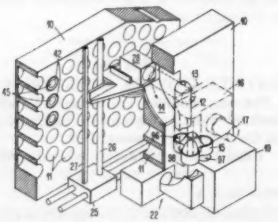
ARTICLE CONVEYING

Davis S. Proper, Arvada, and William J. Rueger, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,732

Int. Cl. B65g *1/06*

U.S. Cl. 214—16.4 A **6 Claims**



1. Article conveying apparatus for handling axially elongated circularly cylindrical articles,

the improvement including in combination:

a storage compartment wall having an open side for storing a plurality of the articles with a given end always facing outward from said open side when stored, during storage said articles having an axis disposed horizontally;

an article receiver having an open end and pivotable between horizontal and vertical positions, when in a horizontal position said open end is positioned at said open side, means pivotally mounting said receiver to said compartment wall for pivoting between said horizontal position and said vertical position wherein said open end faces downwardly, means yieldably urging said receiver to said horizontal position;

movable means for selectively conveying an article from a compartment to said receiver;

an indexable rotary conveyor having a plural article retainer assembly for successively receiving a plurality of articles from said receiver, each index position of said rotary conveyor having one article retainer under said article receiver;

reciprocating work means movable through said retainer assembly for selectively removing an article from said retainer assembly to a work position below said retainer assembly;

driving means connected to both said rotary conveyor and said work means for synchronizing the operation thereof; and

exit means receiving said article from said rotary conveyor including means for receiving said article moving in the first direction, means pivoting about an axis parallel to said first direction for moving said article in a direction transverse thereto.

3,854,606

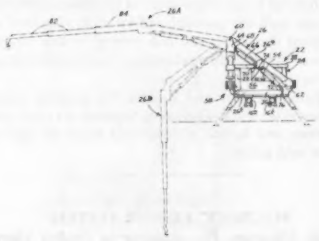
VEHICLE WITH MATERIAL LOADER

Charles T. Hayes, Oakland; Donald M. Faust, Winchester, and Harry F. Weinert, Portland, all of Oreg., assignors to Cascade Corporation, Portland, Oreg.

Filed Nov. 26, 1971, Ser. No. 202,245

Int. Cl. B60p *1/48*

U.S. Cl. 214—77 R **7 Claims**



1. In combination with a vehicle having a vehicle frame, a material-handling boom and frame construction, comprising

supporting frame structure having opposed ends and front and rear sides extending between such ends, said frame structure being mounted on the vehicle frame with such occupying an upstanding position and having its front and rear sides extending transversely of the vehicle frame and its ends adjacent opposite sides of the vehicle,

a foldable boom assembly including main and jib sections located laterally of one of said sides of the supporting frame structure and adapted to be folded and lowered to a stowed position disposed in laterally adjacent relation to said one side, and

swivel means journaling the base of the main section of the boom assembly on said supporting frame structure adjacent an end of the supporting frame structure and at one side of the vehicle with said base above the top of said

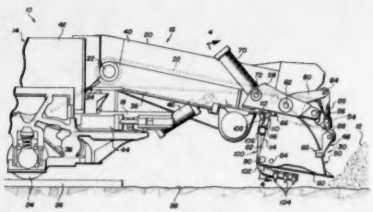
supporting frame structure permitting side-to-side swiveling of the boom assembly over the top of the supporting frame structure with the boom assembly unfolded and raised,

said main boom section with the boom assembly in its stowed position inclining downwardly from said swivel means and across the vehicle to an end disposed on the vehicle's other side adjacent the base of said supporting frame structure.

3,854,607
TRACTION ASSIST MEANS FOR LOADING MACHINES AND THE LIKE

Haim J. Kamner, Palatine, Ill., assignor to Goodman Equipment Corporation, Chicago, Ill.

Filed Dec. 18, 1972, Ser. No. 316,406
Int. Cl. B66f *9/00*
U.S. Cl. 214—140 **11 Claims**



1. A loading machine comprising, in combination, frame means movable along a ground surface to a position generally adjacent a pile of loose material to be loaded, bucket means supported by said frame means for movement from a lowered position adjacent the pile of material to an advanced position into the pile of material to load said bucket means, and thereafter to an elevated position effective to dump said material from said bucket means onto said frame means, first operating means including actuating cylinder means and swing arm means cooperative with said bucket means to effect said movement thereof, and traction assist means including at least one ground engaging member supported by said frame means rearwardly from and independently of said support of said bucket means by said frame means, and second operating means operatively associated with said actuating cylinder means in a manner to move said ground-engaging member to a ground engaging position and effect movement of said frame means toward the pile of material as said bucket means is moved to its said advanced position by said first operating means, said second operating means being further operative to maintain said ground-engaging member in said ground engaging position throughout movement of said bucket means from its lowered position to its said elevated position so as to stabilize said frame means during a loading cycle.

3,854,608
MATERIALS HANDLING

Carroll H. Arnold, Hubbardston, Mass., assignor to Wain-Roy Company, Inc., Hubbardston, Mass.

Continuation-in-part of Ser. No. 133,501, April 13, 1971, Pat. No. 3,767,070. This application Dec. 2, 1971, Ser. No. 203,977
Int. Cl. E02f *3/70*
U.S. Cl. 214—145 **29 Claims**

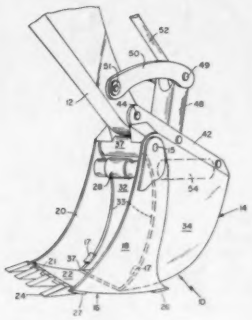
1. A materials handling attachment for connection by engagement with an excavation bucket of the type including first and second sections, each having two sides and a bottom, mounted for pivotal movement relative to each other between a relatively closed position and a relatively open position, said attachment comprising:

a materials handler; and,

an attacher rigidly connected to said handler and defining three pairs of generally oppositely-facing engagement surfaces arranged for engaging respective surfaces defined by said bucket,

a first pair of said engagement surfaces including a generally rearwardly facing surface arranged for engaging a generally forwardly-facing surface defined by said first section, and a generally forwardly-facing surface located forwardly of said rearwardly-facing surface and arranged for engaging a generally rearwardly-facing surface defined by said second section;

a second pair of said engagement surfaces being generally perpendicular to said first pair and including a generally downwardly-facing surface arranged for engaging a generally upwardly-facing surface defined by said first section, and a generally upwardly-facing surface arranged for engaging a generally downwardly-facing surface defined by said second section, said upwardly-facing surface



of said second pair being spaced from said downwardly-facing surface of said second pair in the direction away from said first section and being on the side of said first pair opposite said downwardly-facing surface of said second pair, and

a third pair of said engagement surfaces being generally perpendicular to said first pair and including a generally downwardly-facing surface on the side of said first pair opposite said downwardly-facing surface of said second pair and arranged for engaging a generally upwardly-facing surface defined by said second section, and a generally upwardly-facing surface arranged for engaging a generally downwardly-facing surface defined by one of said sections and spaced from said downwardly-facing surface of said third pair in the direction toward said first section.

3,854,609
BOOM SUPPORTED MATERIAL HANDLING FORK

Randal A. Cox, Rural Rt. 1, Van Wert, Iowa 50262

Filed Mar. 12, 1973, Ser. No. 340,173
Int. Cl. B66c *3/04*
U.S. Cl. 214—147 G **3 Claims**

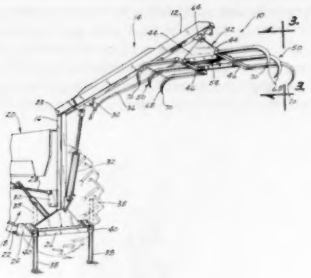
2. A material handling unit comprising,

a boom mounted at its lower end on the rear end of a tractor, by means of a three-point hitch, said hitch having lifting arms, said boom including inner and outer pivotally connected boom sections and said inner boom section including a cross member to which the lifting arms of said three-point hitch are connected.

a pair of vertically adjustable supports carried on said cross member adapted to engage the ground and support said boom when said lift arms are in a lowered position whereby said lift arms may be lowered further to be disconnected from said cross arm,

a power means for raising and lowering the outer end of said boom,

a fork unit on the outer end of said boom; said fork unit including an A-shaped frame having its apex pivotally connected to said boom and a pair of cooperating fork members having upper pivot arms pivotally connected to the lower ends of the sides of said A-shaped frame, an upstanding ear on each of said pivot arms of said fork members, and



a hydraulic power cylinder extending between the sides of said A-shaped frame and having its opposite ends connected to said upstanding ears on the pivot arms of said fork members for pivoting said fork members to a closed position when said cylinder is extended and to an open position when said cylinder is contracted.

3,854,610

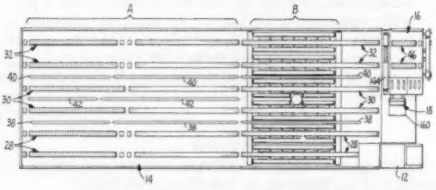
FREIGHT TRANSPORTER AND LOADER FOR AIRCRAFT

Victor H. Carder, San Francisco, Calif., assignor to Cochran-Boothe Airport Systems, San Francisco, Calif.

Filed Apr. 9, 1973, Ser. No. 349,417

Int. Cl. B60p *1/44*

U.S. Cl. 214—520 **3 Claims**



1. A freight unit transporter and loader vehicle for aircraft comprising a conveyor support bed, a pair of conveyor tracks mounted on the bed for movement lengthwise thereof, means for driving the tracks in the same direction, means for driving the tracks in opposite directions, and freight unit support means located between the tracks and operable when the tracks are driven in opposite directions to assist in pivotally reorienting a freight unit carried by the tracks, said support means comprising a pad member, having a freight unit contacting surface of substantial, horizontally disposed area means mounting said member for movement upwardly to an operative position in engagement with the underside of a freight unit and for movement downwardly to an inoperative position out of engagement therewith, and means to raise and lower said member.

3,854,611

METHOD AND APPARATUS FOR FEEDING CIGARETTES OR ANALOGOUS ARTICLES TO PACKING MACHINES OR THE LIKE

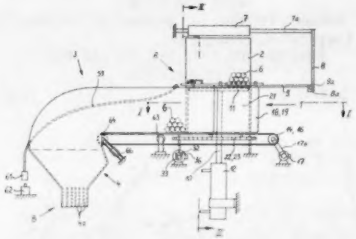
Gunter Wahle, Reinbek, Germany, assignor to Hauni Werke Korber Co. KG, Hamburg, Germany

Filed Apr. 19, 1972, Ser. No. 245,409

Claims priority, application Germany, Apr. 21, 1971, 2119311

Int. Cl. B65g *65/04*

U.S. Cl. 214—302 **23 Claims**



1. A method of feeding to a consuming station cigarettes or analogous rod-shaped articles which are transported on holders from at least one producing station to an evacuating station in the form of stacks of confined parallel articles and are further processed at the consuming station, each stack being made up only of the entire contents of one said holder, comprising the steps of withdrawing each successive stack from each successive holder at said evacuating station by moving the stack in a substantially vertical direction only — while maintaining the articles of the respective stack in at least substantially unchanged position with respect to each other — to an intermediate supply station where each of the thus withdrawn stacks forms an intermediate supply of articles; transporting each of said stacks of articles from said intermediate supply station in a substantially horizontal direction by moving the articles of said stack sideways and while maintaining the articles of the respective stacks in at least substantially unchanged position in which they have been during vertical movement from said evacuating station to said intermediate supply station whereby the thus successively transported stacks form a main supply of articles; and transferring articles from said main supply to the consuming station in at least substantially parallel position with respect to each other and at the rate at which the articles are being processed at said consuming station.

3,854,612

CONTAINER DISCHARGE SYSTEMS

George W. Snape, Shipston-on-Stour, England, assignor to Bulk Unit Load Systems Limited, Warwickshire, England

Division of Ser. No. 210,940, Dec. 22, 1971, abandoned. This application May 11, 1973, Ser. No. 359,479

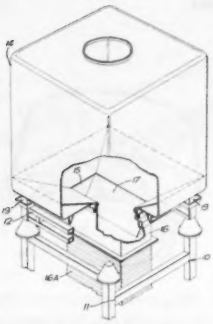
Claims priority, application Great Britain, Dec. 28, 1970, 61380/70; Feb. 23, 1971, 5234/71; Mar. 30, 1971, 8181/71

Int. Cl. B65g *67/40*

U.S. Cl. 214—308 **10 Claims**

1. A bulk container discharge apparatus comprising a vibratory support frame having means to support a container, and on which there is a vibratory device to vibrate the container when placed thereon by the application to the vibratory support frame of forced vibrations of different characteristics, depending upon the amount of material in the container, in which the vibratory device comprises two out of balance weights, one of which is capable of being fixed rigidly to a rotatable shaft, and the other of which is mounted on and is

rotatable relative to said shaft, which weights have two pairs of corresponding abutments disposed so that when the shaft is



rotated in different directions, the weights take up configurations giving different combined effects.

3,854,613

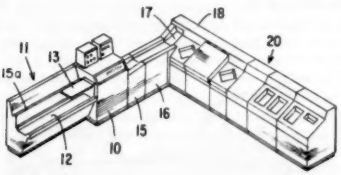
BATCH TO CONTINUOUS FLOW MAIL HANDLING

Donald F. Renfrow, Richardson, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Filed Aug. 3, 1973, Ser. No. 385,295

Int. Cl. B65g *65/04*

U.S. Cl. 214—314 **5 Claims**



1. A system for handling stacks of mail unloaded from mail trays which comprises:

a. a mail tray turnover box including a load end, an unload end, and a bottom panel on which stacks of edge supported mail pieces are deposited from mail trays, said bottom panel having laterally spaced longitudinal slots extending through said unload end,

b. paddle means actuated when each stack is placed on said bottom panel to move said stack in the direction of said unload end, said paddle having vertical slots open at the bottom paddle edge and aligned with said longitudinal slots,

c. a rank of aligned upstanding fingers mounted to follow a closed course having an upper traverse arranged so that the tips of said fingers pass upward through said longitudinal slots and through said vertical slots during movement through said unload end to push each stack away from said paddle and out of said box, and

d. means to turn over said box.

3,854,614

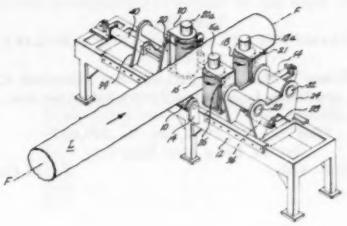
LOG FEEDING AND TURNING MACHINE

Dennis W. Albrecht, Seattle, Wash., assignor to Stetson-Ross Machine Company, Inc., Seattle, Wash.

Filed Oct. 5, 1972, Ser. No. 295,207

Int. Cl. B65h *51/26*

U.S. Cl. 214—339 **15 Claims**



1. Apparatus for endwise feeding and rotational positioning of a log during feeding in a feed path comprising means to support and guide a log for longitudinal movement along a feed path, mutually opposing feed rolls, opposing support means disposing the respective feed rolls with their respective rotational axes in normal feed positions substantially parallel to each other and transverse to the feed path adjacent opposite sides of a log in the feed path, including positioning means cooperating with the respective support means for positioning the rolls in driving engagement with the log, the positioning means for the rolls on opposite sides of the log being yieldable relative to each other transversely to the log to accommodate varying log contours with the rolls in said driving engagement, drive means for rotating the rolls about their respective axes to apply cooperative feeding forces to the log engaged by the rolls so as to move it endwise in the feed path, and tilt means selectively operable for tilting the opposing driven rolls out of their normal feed positions in respectively opposite directions by substantially equal amounts in respective planes parallel to the feed path so as to apply to the log cooperative log rotating forces accompanying ccoperative endwise log feeding forces both applied by roll rotation.

3,854,615

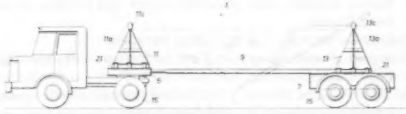
TRUSS CARRIER

William G. List, 7718 Lettie, Houston, Tex. 77034

Filed June 8, 1973, Ser. No. 368,204

Int. Cl. B60p *1/16*

U.S. Cl. 214—501 **9 Claims**



1. In a lateral unloading carrier of the type generally comprising front and rear frame means connected to one another by a chassis having a central axis, and including a pair of load support means pivotally affixed to each said frame means so that each of said pair is adapted to pivot laterally of the central axis, the improvement comprising

pivotally affixing each of one of said pairs of load support means on one of said frame means on either side of said central axis at a first given distance therefrom,

pivotally affixing each of said other pair of load support means on the other of said frame means on either side of said central axis at a second given distance therefrom which is greater than the first given distance,

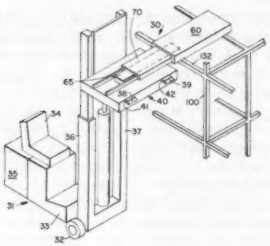
each of said pair of load support on the rear frame means being adapted to cooperate with each of the front load support means on the corresponding side of the central axis so that lateral pivoting of either of said other pair of load support means results in a following pivotal movement by its cooperating load support means when a common load is carried by both of them.

3,854,616

SIDE-LOADING ATTACHMENT FOR FORKLIFT TRUCKS

Wilfred Ernest Willis, 3633 Jackson, San Francisco, Calif. 94118, and Dickie L. Johnston, 10944 Ridgeview Ave., San Jose, Calif. 95127

Filed Sept. 20, 1972, Ser. No. 290,637
Int. Cl. B65g *1/06;* **B66f** *9/14*
U.S. Cl. 214—620 **14 Claims**



1. A side-loading attachment for a device having a support portion and means for raising and lowering said support portion vertically, said attachment being used in conjunction with load-supporting pallets and storage means for supporting loaded said pallets, including in combination:

a base frame for support by said support portion,

means for locking said base frame to said support portion to prevent relative vertical movement between said base frame and said support portion,

a pair of laterally extending channel members rigidly secured to said base frame and lying thereabove,

a stabilizer laterally disposed with respect to said base frame, said stabilizer having at each side thereof a plurality of rollers riding in and on said channel members for sidewise movement of said stabilizer, laterally of said base frame, whereby said stabilizer never tilts relative to said base frame,

means for moving said stabilizer laterally,

fore-and-aft extending pivots on the fore-and-aft axis of said base frame,

an upper frame pivotally supported on said pivots so as to be tiltable relative to said base frame,

a pallet-and-load-supporting platform supported by said upper frame at a level above said stabilizer, at all times supported separately from said stabilizer for movement wholly independently of said stabilizer, for movement relative to said upper frame in line with the pivotal position thereof,

a plurality of hydraulic jacks on each side of said base frame and in contact with said upper frame for leveling said upper frame relative to said base frame and for tipping it in either direction, the jacks on one side of said axis raising while the jacks on the other side lower and vice versa, and

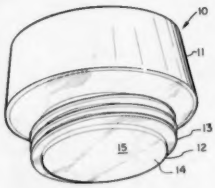
platform moving means for moving said platform out where it lies wholly beyond said device.

3,854,617

CLOSURE FOR BOTTLES AND JARS

Edward M. Edwards, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 8, 1973, Ser. No. 321,775
Int. Cl. B65d *39/04*
U.S. Cl. 215—364 **2 Claims**



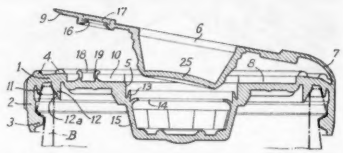
1. A hollow two-piece closure manufactured from plastic material for use with a wide mouth container comprising a handle portion having a generally top planer surface and an annular grasping flange, a container insertion portion (**12**) of generally elliptical cross-sectional configuration telescopically coupled to said handle portion (**11**) along a longitudinal axis, locking means (**27**) (**33**) coupling said handle portion with said insertion portion, a plurality of resilient spaced apart radial fins (**13**) arranged on said insertion portion normal to said longitudinal axis, said fins each completely encompassing said insertion portion and having a radial extent, at all locations, that is equidistant from said container insertion portion.

3,854,618

VACUUM PACKAGING

Gino P. Beghnini, 42 Rue d'Avron, 75020 Paris, France

Filed July 25, 1973, Ser. No. 382,483
Int. Cl. B65d *47/20*
U.S. Cl. 215—307 **8 Claims**



1. A lid assembly moulded of plastics material for closing a container to be evacuated, the assembly comprising:

i. a lid having a portion defining an opening;

ii. a generally frusto-conical valve member for closing the opening;

iii. means hingedly connecting said valve member to said lid;

iv. gripping means connected to said valve member;

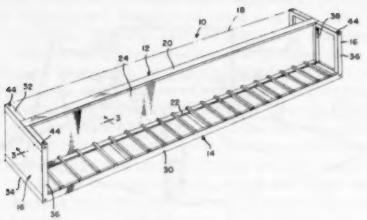
v. inner and outer lips on said lid for engaging the edge of the opening of a container to be closed by the lid assembly; and

vi. first and second lips on said lid portion defining the opening, said first lip extending outwardly of the lid generally perpendicular to the general plane of the lid and said second lip extending generally parallel to the general plane of the lid inwardly of the opening.

3,854,619
TRANSFERABLE CARGO CONTAINER

Oliver M. Gaudy, 2466 E. Sammamish Rd. North, Redmond, Wash. 98052

Filed May 10, 1973, Ser. No. 358,888
Int. Cl. B65j *1/00;* **B65d** *19/00*
U.S. Cl. 220—1.5 **7 Claims**



1. A transferable cargo container capable of being moved as a unit with its cargo from one carrying vehicle to another, such as from a trailer to a ship, said container having a longitudinal axis and a transverse axis and a predetermined length, width and height, said container defining a cargo carrying space having a bottom, top, sides and ends, said container comprising:

a. a main longitudinally extending vertically positioned beam member located proximate a longitudinal center axis of said carrier, said beam comprising:

1. an upper longitudinally extending beam portion located proximate the top center of said cargo carrying space to withstand upper beam bending moment forces,

2. a lower longitudinally extending beam portion located at the bottom center of said cargo carrying space and coacting with said upper beam to withstand lower beam bending moment forces,

3. a vertical web portion interconnecting said upper and lower beam portions in load bearing relationship and providing cargo center partition means for maintaining cargo in proper position on said container, and

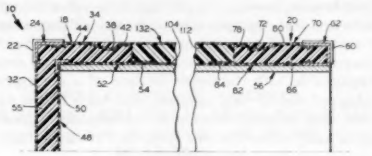
b. a lower load supporting framework located at the bottom of said cargo space for cargo support, said framework having a plurality of longitudinally spaced secondary beam means cantilevered from a lower part of said main beam in opposite laterally extending relationship therefrom, in a manner that vertical cargo loads on said secondary beam means are transmitted into said main beam.

3,854,620
CONTAINER

Glen W. Saidla, Wyomissing Hill, Pa., assignor to Dana Corporation, Toledo, Ohio

Division of Ser. No. 139,427, May 3, 1971, Pat. No. 3,802,975.
This application Oct. 2, 1972, Ser. No. 294,136
Int. Cl. B65d *11/22*
U.S. Cl. 220—9 F **10 Claims**

1. A container comprising (a) a hollow body section which is rectangular when viewed in transverse cross-section, (b) at least one end cap having inner and outer skins spaced from each other and an inner and outer longitudinally extending lip portion which forms a part of said inner and outer skins respectively with said inner lip extending longitudinally beyond said outer lip, (c) a transversely extending rectangularly shaped end skin portion connected to said outer lip portion on said outer skin of said end cap, (d) a rectangular metallic member including four pieces of angle iron with one leg thereof bonded to said outer lip portion and the other leg thereof bonded to said end skin portion and having corner castings interconnecting said pieces of angle iron, (e) a transversely extending rectangularly shaped end skin portion on said inner skin connected to said inner lip portion and forming an end wall for said container, (f) a second rectangular metallic member comprised of four interconnected pieces of angle iron, (g) said second rectangular member engaging the surface of said inner skin which faces said outer skin at the junction of said inner lip portion and said end skin portion of said inner skin, (h) a plurality of interconnecting metallic elements connecting said rectangular metallic members, (i) an inner body skin overlapping and bonded to said inner lip portion

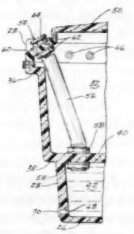


and extending longitudinally therefrom, (j) an outer body skin overlapping and bonded to said outer lip portion and extending longitudinally therefrom in a spaced and substantially parallel relationship with said inner body skin, (k) a peripheral groove in said outer lip portion spaced inwardly from the longitudinally inner end thereof and the overlapping portion of said outer body skin fits into said peripheral groove, and (l) a core of structural insulating material disposed between and bonded to said inner and outer end skins and body skins.

3,854,621
AUXILIARY STORAGE DEVICE FOR VEHICLES

Alan C. Parry, Des Moines, Iowa, assignor to Mid-America Body & Equipment Co. Inc., West Des Moines, Iowa

Filed May 7, 1973, Ser. No. 358,007
Int. Cl. B65d *85/00*
U.S. Cl. 220—20 **3 Claims**



3. An auxiliary storage device for vehicles having a box therein with opposite side walls, a front wall, and a floor, said storage device comprising:

a. an elongated housing having a plurality of exterior walls including a top wall, a front wall, and end walls and at least one interior wall to form at least two enclosed compartments therein;

b. a fuel spout mounted in said top wall providing communication from the interior of one of said compartments to the exterior of said housing whereby fuel may be introduced into one of said compartments;

c. at least one door opening in said top wall providing communication into the other of said compartments;

d. a door covering for said door opening movable out of a covering relation with said door opening to provide access to the interior of said other compartment;

e. said one interior wall being horizontal and located below said top wall and said one compartment constituting a

fuel storage compartment positioned below said other storage compartment,

f. said fuel spout extended from said top wall through said other compartment and said one interior wall into said fuel storage compartment, said fuel storage compartment having a bottom wall and a plurality of side walls formed by certain of said exterior housing walls and an outlet opening in one of said certain exterior walls for removal of fuel from said fuel storage compartment, and

g. means for selectively opening and closing said outlet opening;

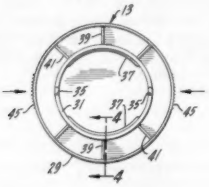
h. said housing having a length slightly less than the spacing between said opposite side walls and a flange extended transversely of the upper exterior surface of each end wall thereof having a downwardly facing horizontal shoulder engageable with the upper surface of a corresponding adjacent one of said opposite side walls of the vehicle box, said housing front wall positionable against and detachably secured to the front wall of said vehicle box.

3,854,622

CHILDPROOF COVER

Robert A. McKirnan, Winnetka, Ill., assignor to Knight Engineering & Molding Co., Arlington Heights, Ill.

Filed Dec. 5, 1972, Ser. No. 312,284
Int. Cl. B65d *83/14*
U.S. Cl. 220—60 A **6 Claims**



1. A childproof cover for a container such as an aerosol container having a roof, a circular collar located on said roof with said collar having an undersurface positioned above said roof, said cover being formed of a flexible plastic and including:

a circular top, and outer skirt depending from said circular top, an inner skirt coaxial with said outer skirt and also depending from said top, a pair of lips projecting inwardly from the lower end of said inner skirt and positioned to engage the undersurface of said circular collar when said cover is positioned on said container, said lips being spaced from and located opposite to each other,

a pair of slits formed in said inner skirt and extending from the lower edge thereof towards the circular top with said slits being located generally diametrically of each other and between said lips, and

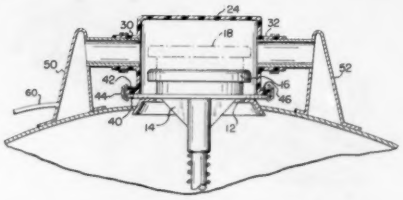
a pair of webs connecting said outer and inner skirts with said webs positioned relative to said slits so that forces inwardly applied to opposite sides of said outer skirt at the lower edge thereof adjacent said slits will cause distortion of said outer skirt and radially outward movement of said webs which in turn will cause distortion of said inner skirt and release of said lips from engagement with the undersurface of said circular collar.

3,854,623

FLUID STORAGE TANK EMISSION COLLECTION HOOD

Karl B. Pierson, Warren, Pa., assignor to Betts Machine Company, Warren, Pa.

Filed Nov. 1, 1972, Ser. No. 302,841
Int. Cl. B65d *25/00*; **F16l** *35/00*
U.S. Cl. 220—85 P **8 Claims**



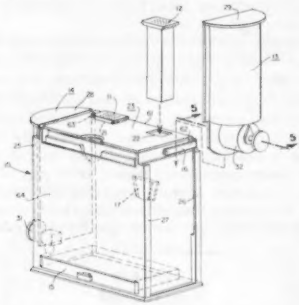
1. An emission collection device for a fluid storage tank vent comprising, a fluid storage tank vent hood configured to completely enclose the tank vent to collect gaseous vapors emitting from the vent, said hood having at least one outlet for directing the collected vapors therein to an associated vapor collecting tank, said hood being formed of a flexible resilient material whereby if the tank is inadvertently overturned the hood will collapse and automatically return to its original shape when the tank is uprighted.

3,854,624

MEAL SERVICE SET

Daniel G. Canci, 355 Margate Rd., Upper Darby, Pa. 19082

Filed Aug. 10, 1973, Ser. No. 387,510
Int. Cl. A47g *19/24*
U.S. Cl. 221—96 **4 Claims**



1. A meal service set comprising:

a casing open at one end adapted to contain a supply of napkins;

spring-actuated napkin compressing means within said casing;

an adjustably tightenable hinged casing lid, positioned at the open end of said casing such that a slot exists between said casing and said lid at a non-hinge edge of said lid through which one napkin at a time may be removed without opening said lid;

two rigid plates within said casing, between which the napkins are compressed, the plate nearest the slot having a smooth surface facing the napkins which promotes the easy removal of the napkins;

salt and pepper shakers, removably attached to said lid;

a cream dispenser, removably attached to a side of said casing, adapted to be used for dispensing cream while attached to said casing;

means on said casing adapted for quick attachment of said casing to a wall, and removal therefrom;

a carrying handle attached to said casing, adapted to be swiveled to a non-functional out-of-the-way position when said picnic service set is in use;

a separate drawer within said casing, adapted to contain articles of the approximate size and shape of tea bags; and a sugar dispenser including means adapted to incrementally dispense one teaspoon of sugar at a time, said dispenser being removably attached to a side of said casing, and adapted to be used for dispensing sugar while attached to said casing, said means adapted to incrementally dispense one teaspoon of sugar at a time comprising a rotatable hollow cylindrical chamber having a cylindrical wall in rotational sliding contact with an opening beneath and communicating with the sugar, said cylindrical wall having a slot communicating with the interior of the cylindrical chamber through which the sugar enters the chamber when the slot is rotated to juxtaposition with the sugar opening, and through which the sugar is dispensed when the slot is rotated to a downwardly facing position.

3,854,625

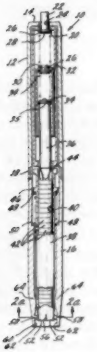
DISPENSING APPARATUS

Ervin L. Kuebler, 589 N. Johnson Ave., El Cajon, Calif. 92021

Filed Feb. 13, 1974, Ser. No. 438,331

Int. Cl. B65h *1/00*

U.S. Cl. 221—198 **13 Claims**



1. An apparatus for dispensing objects of uniform size comprising:

a hollow outer housing having an upper portion with an aperture therethrough and a lower portion with an inner retaining member positioned inward from an outer open end, said open end having a larger diameter than said inner retaining member;

a movable dispensing member disposed within said hollow outer housing and movable from a first position to a second position said dispensing member comprising an upper portion forming an operating button, said button passing through said aperture and has sliding engagement therewith for translating said dispensing member downwadly when depressed and a lower portion having a cavity of uniform diameter for storing a plurality of loose fitting objects for dispensing, a normally restrictive inner wall portion having a smaller diameter than said cavity and a normally flaired outer lip having a larger diameter than said cavity, when said dispensing member is in said first position said inner retaining member is positioned adjacent the normally flaired lip for applying inward pressure thereto for deforming same to a diameter less than said cavity thereby restricting the dispensing of the bottom most object in said cavity and the deforming of said normally flaired lip causes said normally restrictive inner wall portion to bow outwardly to a diameter equal to said cavity thereby allowing unrestricted movement of the objects therethrough and when said operating button is depressed, said dispensing member moves downwardly to said second position placing said normally flaired lip below said inner retaining member thus allowing said normally flaired lip to return to its original configuration for releasing said bottom most object and allowing said restrictive inner wall portion to return to its normal configuration for retaining the now bottom most object and preventing its release therethrough.

3,854,626

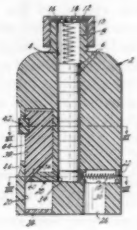
PILL CONTAINER-DISPENSER

Joseph Krechmar, 6001 W 53 Pl., Mission, Kans. 66202

Filed Apr. 30, 1973, Ser. No. 355,937

Int. Cl. B65h *3/00*

U.S. Cl. 221—264 **1 Claim**



1. A container-dispenser for pills and the like comprising:

a. a body member having formed therein an elongated pill reservoir adapted to contain a series of pills in stacked relation, said pills having a uniform thickness longitudinally of said reservoir, a pill discharge opening laterally offset from said reservoir and opening exteriorly of said body member, and a slide passageway extending transversely to said reservoir and interconnecting said reservoir and said discharge opening, said reservoir being otherwise hermetically sealed,

b. a slide longitudinally movable in said passageway, and having a hole formed transversely therethrough the axis of which is parallel to said reservoir, said slide being movable between a first position in which said hole registers with said reservoir and a second position in which said hole registers with said discharge opening, said slide being wedge-shaped in a plane parallel to the reservoir axis, being taperingly reduced in thickness in the direction of movement thereof toward its first position, the walls of said passageway mating with the wedge surfaces of said slide when said slide is in its first position being correspondingly tapered, whereby in said first slide position to provide sealing contact between said slide and body member in encircling relation to the reservoir entry to said passageway, and to the hole of said slide, the thickness of said slide, longitudinally of said reservoir, being respectively less than and greater than the thickness of a single pill at the edges of the slide hole which are respectively adjacent the thinner and the thicker ends of the wedge portion of the slide,

c. resilient means operable to bias a stack of pills contained in said reservoir toward the end of said reservoir interconnected with said slide reservoir,

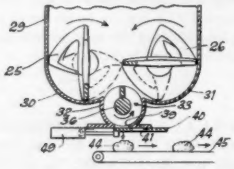
d. manually operable means for moving said slide from said first position to said second position, and

e. resilient means biasing said slide toward said first position.

3,854,627
METHOD AND APPARATUS FOR DISCHARGING MEASURED AMOUNTS OF DOUGH

Uzal E. Coons, Oaklawn, Ill., assignor to Wm. Wrigley, Jr. Company, Chicago, Ill.

Filed June 7, 1971, Ser. No. 150,364
Int. Cl. A21c *11/10*
U.S. Cl. 222—1 9 Claims

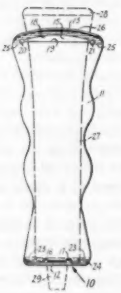


1. Apparatus for manipulating doughy products, said apparatus comprising a container for the products, a discharge opening in the bottom region of the container, rotatable means for moving a portion of the products opposite said opening in a radial direction said radial direction being oriented about a longitudinal axis of said rotatable means, additional means for moving products into said rotatable means behind said radially moving portion, said rotatable means pushing part of the radially moving portion through said opening and severing means on said rotatable means cooperating with the edge of said opening to sever said part from said radially moving portion and thereby form and discharge said part from the container as a discrete loaf.

3,854,628
COLLAPSIBLE TUBE DISPENSER

Harford E. Goings, P.O. Box 64, Manasses, Va. 22110

Filed Nov. 17, 1971, Ser. No. 199,641
Int. Cl. B65d *35/56*
U.S. Cl. 222—103 2 Claims

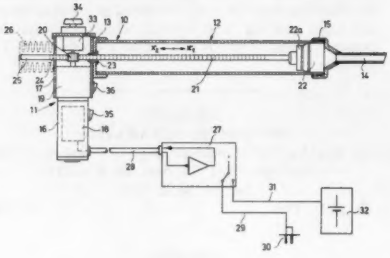


1. A collapsible tube dispenser comprising in combination a collapsible tube and an elongate one piece flexible strip type holder, means on said holder for securing said holder to a wall, a flange integrally formed on the lower end of said dispenser and extending perpendicularly outwardly therefrom, an aperture formed in said flange to receive the dispensing end of the collapsible tube extending therethrough, an arcuate support bar integrally formed on the upper end of said holder delineated by an aperture having a straight generally horizontal lower edge and an arcuate upper edge, said bar offset outwardly of said holder in an arcuate form to provide an opening of a size and shape to receive an arcuate portion of the body of said collapsible tube therein for supporting the collapsible tube for removing the contents therefrom by inward and downward finger pressure thereon.

3,854,629
EJECTING DEVICE

Rudolf Blieberger, Fliederweg 4, D-7057 Winnenden, Germany

Filed June 7, 1973, Ser. No. 367,266
Claims priority, application Germany, June 8, 1972, 2227930; Feb. 17, 1973, 2307947
Int. Cl. B67d *1/16*
U.S. Cl. 222—109 17 Claims



1. A device of the character described, comprising a cylinder having an interior at least partially filled with a substance to be expelled; a piston mounted in said interior of said cylinder for reciprocation with respect thereto between a plurality of positions delimited by a forward position and a retracted position and adapted to expel the substance from said interior of said cylinder during its movement toward said forward position and to draw a medium into said interior of said cylinder during its movement toward said retracted position; nozzle means connected to said cylinder and communicating with said interior thereof for dispensing the substance expelled therefrom; drive means for reciprocating said piston; and retracting means for limited retraction of said piston toward said retracted position subsequently to the termination of each movement toward said forward position to thereby retract the substance present in said nozzle means into said interior of said cylinder and prevent dripping.

3,854,630
APPARATUS FOR INJECTING COLORANT INTO INJECTION MOLDING MACHINE

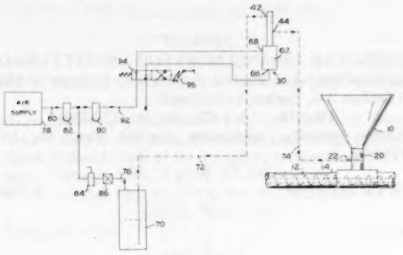
Robert E. Standridge, Covington, Ga., assignor to Evans Products Company, Portland, Oreg.

Filed Apr. 4, 1973, Ser. No. 347,896
Int. Cl. B67d *5/52*
U.S. Cl. 222—135 6 Claims

1. In a plastic processing apparatus having a cylinder, a screw within said cylinder and a hopper mounted above and communicating with said cylinder for retaining a supply in pellet form of the plastic material to be processed, the invention comprising:

a liquid material dispersing means extending into said hopper at a position a short distance above said cylinder, sufficient that said screw is shielded from said dispersing means by said pellets to prevent liquid material extruded from said dispersing means from falling upon said screw; pressurizable supply means for retaining a supply of the liquid material under pressure;

and means communicating with said supply means and said dispersing means for supplying a predetermined amount



of said liquid material from said supply means to said dispersing means at predetermined intervals.

3,854,631

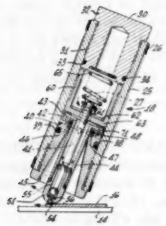
AUTOMATIC DISPENSER FOR HOT FLUIDS UNDER PRESSURE

Lenard E. Moen, 7914 Michigan, Whittier, Calif. 90605

Filed May 4, 1973, Ser. No. 357,501

Int. Cl. B67d *5/62*

U.S. Cl. 222—146 HE **17 Claims**



1. In an automatic high pressure fluid dispenser the improvement comprising:

a dispenser body having an interior chamber for containing a fluid under high pressure;

an actuator retainer affixed within said body and having a passage for mounting an acutator therethrough;

an actuator having a tubular barrel extending through said passage of said container with clearance therebetween;

pivot means, interconnecting a rear inner end of said retainer and a rear inner end of said actuator, comprising rigid, opposed portions of said retainer and said actuator that are biased into pivotal abutment for pivotal movement of said actuator relative to said retainer and body about an axis that is normal to and intersects the longitudinal axis of said passage of said retainer;

and an endless fluid seal means in said clearance intermediate said passage of said retainer and the exterior of said barrel, said seal means and said pivot axis being positioned in substantially a common plane comprising the median plane of said seal means, the coplanar relationship of said axis and said median plane of said seal means, minimizing radial compression of said seal means in response to pivotal deflection of said actuator.

3,854,632

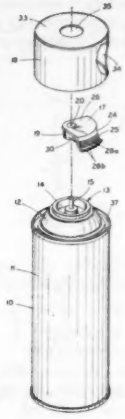
ACTUATING ASSEMBLY FOR AEROSOL SPRAY CAN

Thomas J. Smrt, 4N671 Rt. 59, Bartlett, Ill. 60103

Filed Jan. 12, 1973, Ser. No. 323,145

Int. Cl. B65d *83/14*

U.S. Cl. 222—182 **2 Claims**



1. An actuator for an aerosol spray can having a generally cylindrical body and a valve-equipped top, the valve being adapted to open when moved laterally relative to the longitudinal axis of the can, the actuator comprising a spray nozzle portion mounted on the valve, an intermediate portion extending outwardly from the nozzle portion generally transversely to the longitudinal axis of the can, and a finger portion extending concavely arcuately outwardly and downwardly from the intermediate portion whereby the valve can be opened by pressing the finger portion to move the valve laterally, a cap rotatably mounted on the top of the can, the cap having a generally cylindrical side wall and a top wall, the finger portion of the actuator being positioned inwardly of the side wall, the top wall being provided with an opening therethrough above the nozzle portion of the actuator through which the contents of the can are sprayed when the valve is opened, the side wall of the cap being provided with an opening therethrough, the cap being rotatable on the can between an actuating position in which the opening in the side wall of the cap exposes the finger portion of the actuator and permits the actuator to be pressed to open the valve and non-actuating positions in which an imperforate portion of the side wall of the cap is adjacent the finger portion of the actuator to prevent the actuator from being pressed, the top of the can being generally dome-shaped and the lower periphery of the finger portion of the actuator extending arcuately in a plane extending transversely to the axis of the can with substantially the same curvature as the dome-shaped top, the spacing between the lower periphery of the finger portion and the dome-shaped top when the valve is closed being such that the lower periphery of the finger portion engages the dome-shaped top before the actuator is pressed sufficiently to spray the contents of the can against the top wall of the cap.

3,854,633

ARRANGEMENT FOR SECURING AN ATTACHMENT, SUCH AS A SPRAY PUMP, TO THE NECK OF A BOTTLE

Pierre Bouvaist, Impasse Terracol, Tassin (Rhone), France

Filed Jan. 18, 1973, Ser. No. 324,855

Claims priority, application France, Jan. 19, 1972, 7203011

Int. Cl. G01f *11/38*

U.S. Cl. 222—183 **8 Claims**

1. A device for securing a spray pump on to a container comprising:

a spray pump;
a container provided with a neck;
said spray pump being provided with an annular collar member;
the lower surface of said annular collar member being positionable to bear on top of said container neck;
an intermediate piece which is disposed in direct contact with said annular collar member of said spray pump and with the exterior of said container and which ensures the

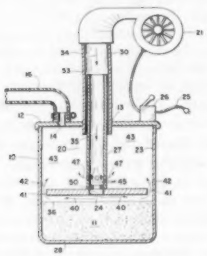
affixing of said spray pump onto the neck of said container;
said intermediate piece comprising a plate spring which bears on the annular collar member of said spray pump and the exterior of said container; and a hollow rigid jacket engaged around said plate spring to hold said plate spring in a locked position to prevent said plate spring from being inadvertently disengaged from said spray pump or from said container.

3,854,634

POWDER DISPENSER

Robert J. Hart, Tulsa, Okla., assignor to Commercial Resins Company, Tulsa, Okla.

Filed Jan. 2, 1974, Ser. No. 429,748
Int. Cl. B67d *5/54*
U.S. Cl. 222—193 **7 Claims**



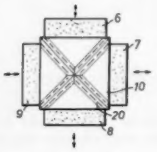
1. A powder dispenser, comprising,
an enclosable powder receiving receptacle having input and output holes,
movable plate means locatable within said receptacle,
a first tube attached adjacent a hole through said plate means and extending through the input hole to outside said container to define an airflow path therebetween,
a second tube disposed about said first tube, extending outwardly from said container from said input hole,
blower means for ejecting a gas into said second tube to be conducted by said first tube through the hole in said plate means to pick up the powder and expel it through the exhaust hole, and for maintaining the position of said plate means above the powder to form a gas flow path of constant dimensions above said powder to provide uniform powder pick up independent of the quantity of contained powder.

3,854,635

SLIDING CAR ARRANGEMENT FOR A SHAFT FURNACE

Friedrich Tschinkel, Thalwil, Switzerland, assignor to Maerz Ofenbau AG, Zurich, Switzerland

Filed Dec. 14, 1973, Ser. No. 424,706
Claims priority, application Austria, Dec. 18, 1972, 10760/72
Int. Cl. B65g *65/58*
U.S. Cl. 222—199 **6 Claims**



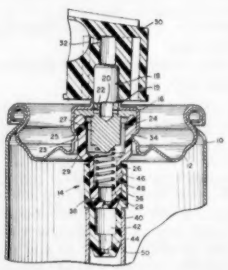
1. A discharge arrangement for a vertically extending shaft furnace having a discharge outlet at its lower end and used for the treatment of bulk material comprising at least three sliding cars located below the lower end of the shaft and movable in a horizontal plane outwardly and inwardly relative to the central axis of the shaft, the discharge outlet from the shaft extending for the entire circumferential periphery of the lower end of the shaft, wherein the improvement comprises that the surfaces of said sliding cars supporting the material within the shaft furnace combine to extend under the full horizontal cross sectional area of the lower end of the shaft for supporting its contents and each said sliding car is movable outwardly from the center of the shaft along a rectilinear path different from the path of the other said sliding cars.

3,854,636

AEROSOL VALVE FOR LOW DELIVERY RATE

John J. Conway, Racine, Wis., and Roger A. Evesque, Cary, Ill., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jan. 15, 1973, Ser. No. 323,679
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.24 **7 Claims**



2. In an aerosol valve of the type having a valve body defining a valve cavity and a restricted valve body orifice through which product enters said cavity from an associated container, a valve stem movably mounted within said cavity and defining an inlet orifice and a discharge passage, a spray nozzle attached to and in fluid communication with said stem and defining a terminal spray orifice, and means to bias said stem to a closed position, the improvement of additional means

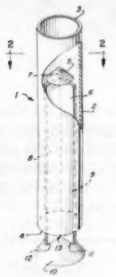
defining at least one expansion chamber positioned below said valve cavity and below said restricted valve body orifice, said additional means defining a second restricted feed orifice for product entry to said expansion chamber, whereby product is delivered by said valve at a reduced flow rate.

3,854,637

APPARATUS FOR LOADING SOLID PARTICLES INTO A VERTICAL VESSEL

Karl A. Muller, Jr., Homewood, Ill.; Lyle M. Lovell, Portage, Ind.; Walker F. Johnston, Flossmoor, and Gerald J. Kramer, South Holland, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed July 20, 1973, Ser. No. 381,042
Int. Cl. B67d *3/00*
U.S. Cl. 222—564 **12 Claims**



1. An apparatus for distributing solid particles into a vertical vessel when said solid particles are being loaded into said vessel, said apparatus being designed for use in a substantially vertical position, which apparatus comprises: (1) a hollow first cylinder having an inlet end at its top and an outlet end at its bottom and having its axis in a vertical position; (2) a first baffle means located in said first cylinder near said inlet end and having its vertex pointed toward said inlet end and being positioned co-axially with said first cylinder, the diameter of the base of said first baffle means being smaller than the inner diameter of said first cylinder; (3) a second baffle means located directly below said outlet end and being positioned co-axially with said first cylinder, the diameter of the base of said second baffle means being at least as large as the inner diameter of said first cylinder; and (4) a third baffle means being co-axial with said first cylinder and having its top connected to the bottom of said first baffle means and its bottom connected to the upper surface of said second baffle means and its vertical sides connected to the inner wall of said first cylinder.

3,854,638

FISH STRINGER AND CARRIER

Denver R. Anderson, 1739 Wilson Ave., Columbus, Ohio 43207

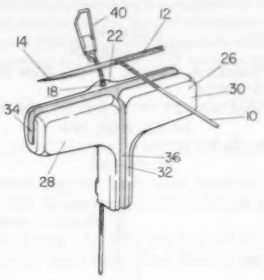
Filed Aug. 9, 1973, Ser. No. 386,998
Int. Cl. A45f *3/00*
U.S. Cl. 224—7 E **7 Claims**

1. A fish stringer device comprising:

a. a flexible cord means;

b. a needle means attached to one end of said cord means intermediate the end of said needle means; and

c. a hand grippable generally T-shaped body attached to said cord means at a substantially central portion of said body and spaced from said needle means, said body formed, in an operable position, by a pair oppositely extending horizontal arms and a downwardly extending vertical arm with a generally horizontal, upwardly opening elongated slot for removably receiving said needle



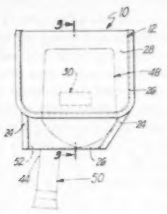
means and a generally vertical slot intersecting said horizontal slot for removably receiving a portion of said cord.

3,854,639

TOOL HOLDER

Rocco Genchi, 1154 Kraemer Pl., Anaheim, Calif. 92806

Filed Feb. 26, 1973, Ser. No. 335,481
Int. Cl. A45c *1/04*
U.S. Cl. 224—26 B **4 Claims**



1. A tool holder adapted to be worn by the user of and contain a tool kit including a handle a hatchet head to be attached to said handle to form a hatchet having a blade extending laterally to one side of the handle, and a shovel blade to be attached to the handle to form a shovel, said holder comprising:

a holster-like tool case including front, center, and rear walls having side and bottom edges joined to one another to form an upwardly opening front pocket between said front and center walls and an upwardly opening rear pocket between said center and rear walls, and a pocket closure flap joined to said rear wall and foldable forwardly over said pockets and downwardly against said front wall,

one of said pockets being adapted to receive said shovel blade and the other pocket being adapted to receive said hatchet head when attached to said handle to form said hatchet a,

said one pocket being relatively deep to contain substantially the entire shovel blade, and said other pocket being relatively shallow compared to the depth of one pocket to contain said hatchet head and having a bottom opening adjacent one side edge of said other pocket through which said handle may extend when attached to said hatchet head,

coacting means on said front wall and flap for releasably securing said flap to said front wall, and

means on said rear wall for attaching said case to the user's belt, wherein said front pocket is the shovel blade receiving pocket and said rear pocket is the hatchet head re-

ceiving pocket and said rear pocket is generally cylindrically formed along said one side edge to accommodate said handle.

3,854,640

SKI CARRIER

Charles T. Willmarth, 1245 S. Beverly Glen Blvd., Los Angeles, Calif. 90024

Filed Sept. 27, 1973, Ser. No. 401,503
Int. Cl. A45f *5/00*
U.S. Cl. 224—28 R **8 Claims**

1. A carrier for a pair of skis arranged bottom to bottom with their bindings projecting oppositely, and including: a substantially flat base affixed to a supporting cuff adapted to surround the wrist of a skier, a housing of deformable material and of inverted cup-shape overlying the base and supported by a central column extending from one side of the base, a lanyard of flexible cord anchored to one of said base and column and adapted to wrap around the column for storage within the housing chamber and to alternately unwrap and extend from between the base and said overlying deformable housing, the free end of the lanyard including means for releasably looped engagement around the pair of skis, said housing of deformable material being comprised of a circularly-shaped top wall carried by and spaced by the central column to overlie the said one side of the base, and of a peripheral wall concentrically circular in form around the said central column and depending from the top wall and said peripheral wall having a lower edge normally juxtaposed to the said one side of the base, said lanyard being wrapped or unwrapped about the central column and within said housing by manually drawing the lanyard beneath the flexible housing and between the lower edge of the peripheral wall and the base, said lower edge deflecting either inwardly or outwardly to permit the lanyard to pass therebelow.

3,854,641

ARTICLE CARRIER FOR RECREATIONAL VEHICLES

Richard S. Kohls, 802 N.E. Ravenna Blvd., Seattle, Wash. 98115

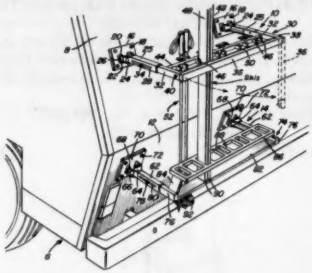
Filed Feb. 27, 1973, Ser. No. 336,327
Int. Cl. B60r *9/00*
U.S. Cl. 224—29 R **6 Claims**

1. A carrier for skis and related equipment adapted for use on substantially vertical support surfaces, such as the rear end or side surface of a camper, van or similar recrational vehicle, comprising:

complimentary upper and lower carriers for racking and clamping skis and ski poles vertically,

means mounting the upper and lower carriers to upper and lower areas of the support surfaces, respectively, including (**1**) extensible and retractable members connected to the upper and lower carriers, and (**2**) means secured to the support surfaces mounting the extensible and retractable members and carriers connected thereto for vertical movement,

wherein the upper carrier includes a pair of spaced, parallel, co-planer end members interconnected medially by a co-planer brace and a clamping area extending parallel to the brace for clamping skis in place between the brace



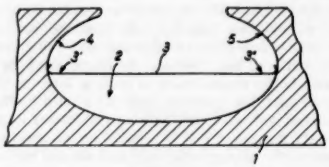
and the arm, one end of the arm pivotally mounted to the other terminal end of one end member and the other end of the arm having key lockable retaining means connecting the other end of the arm to the outer terminal end of the other end member.

3,854,642

METHOD OF GUIDING A THIN FLEXIBLE WEB STRIP WHICH IS AT LEAST PARTIALLY METALLIC

Pierre Mueller, Preverenges, Switzerland, assignor to J. Bobst & Fils S.A., Prilly, Switzerland

Continuation of Ser. No. 127,178, March 23, 1971,. This application Jan. 26, 1973, Ser. No. 326,686
Int. Cl. B65h *23/04*
U.S. Cl. 226—3 **6 Claims**



1. A method of guiding a thin flexible web strip which is at least partially metallic, said web strip having opposite curled edge portions, comprising:

receiving and running the web strip within and through a guide having two uniformly curvilinear guide surfaces extending generally upwardly from a common base and facing one another and providing intermediate their height allochiral bights spaced apart slightly less than the width of the web strip between opposite edges of the web strip;

engaging said curled edge portions of the web strip in lateral alignment within said bights and thereby guiding the web strip as it runs through the guide;

and as the strip runs through the guide maintaining the curled edge portions in said bights and thereby maintaining said web strip below upwardly extending portions of said surfaces and freely spaced above said base and above downwardly extending portions of said surfaces.

3,854,643

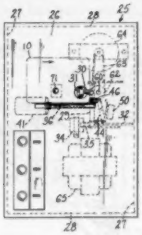
SPLICE FINDER

Preston R. Weaver, Rocky Hill, Conn., assignor to UMC Electronics Company, North Haven, Conn.

Continuation-in-part of Ser. No. 339,704, March 9, 1973, abandoned. This application Nov. 14, 1973, Ser. No. 415,650

Int. Cl. B65h 23/16

U.S. Cl. 226—35 13 Claims



1. Apparatus for detecting a splice in a length of recording tape where two ends of tape are spanned by a splicing tape, comprising a capstan for driving the tape, a pressure wheel adapted to contact the tape on one side thereof and hold said tape against the capstan, said pressure wheel being carried on a movable shaft, means for moving said shaft toward a retract position away from said capstan, means for holding said shaft in an operating position in which the pressure wheel engages the tape, and sensing means responsive to movement of said shaft when a splice on said tape passes between said capstan and said pressure roller for deactivating said holding means whereby said moving means moves said shaft towards a retract position.

3,854,644

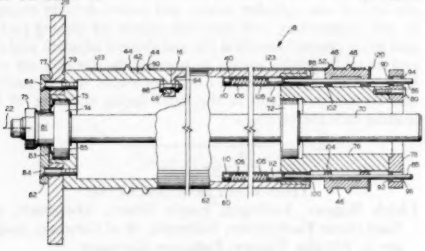
PLOTTER SYSTEM AND METHOD OF OPERATION

Heinz Joseph Gerber, West Hartford, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Apr. 20, 1973, Ser. No. 353,116

Int. Cl. G03b 1/24

U.S. Cl. 226—79 8 Claims



1. A drum for advancing a strip of recording material thereover in a flattened condition comprising:

a first rotatable member having an axis of rotation and first engaging means located about the axis of rotation for engaging the strip of material at one longitudinal edge as the strip passes over the drum:

a second rotatable member positioned coaxially of the first member and the axis of rotation and having second engaging means located about the axis of rotation for engaging the strip of recording material at the other longitudinal edge as the strip passes over the drum;

a set of support rods extending between the first and second rotatable members in parallel with the axis of rotation, each rod being fixedly attached to one of the members and slidably received in the other of the members to allow relative movement of the two members in the axial direction and to couple the members together for simultaneous rotational motions about the axis in unison; and

resilient means interposed between the two rotational members for urging the one member axially away from the other.

3,854,645

CLAMPING AND TRANSFER DEVICE FOR ELONGATE ARTICLES

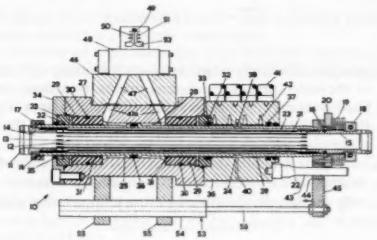
Richard Northan Knights, Gloucester, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, Warwickshire, England

Filed Aug. 13, 1973, Ser. No. 387,726

Claims priority, application Great Britain, Aug. 25, 1972, 39704/72

Int. Cl. B65h 17/36

U.S. Cl. 226—162 7 Claims



1. A clamping and transfer device for transferring tube, rod or like articles in a direction longitudinally of the article, the device comprising a housing having a bore therein, a hollow piston slidably mounted in the bore for longitudinal movement therealong, fluid-supply passageways in the housing for supply of fluid to move the piston in both senses of longitudinal movement, and a radially contractible article-engaging tubular clamping member disposed within the follow piston with end portions of the clamping member fluid-tightly mounted in respect of end portions of the piston,

the improvement consisting in a valve block mounted on the housing and having a bore through which is movable part of the piston and which provides an annular fluid-supply channel, a plurality of orifices in the piston providing communication from the fluid-supply channel to between the piston and the clamping member throughout movement of the piston in the valve block, and valve means on the valve block connected to the annular fluid-supply channel, whereby fluid can be supplied between the piston and the clamping member thereby to pressurise and radially to compress the clamping member onto an article when the piston is moving in one sense of direction, and whereby fluid can be returned from between the piston and the clamping member to release pressure on the clamping member while the piston is moving in the other sense of direction.

3,854,646

PRESSURE-BALANCED WIDE WEB GUIDE ROLLER

Walter Dorfel, and Bernd Gorner, both of Weilheim-Teck, Germany, assignors to Ahlstrom Development GmbH, Weilheim-Teck, Germany

Filed July 10, 1973, Ser. No. 377,921

Int. Cl. B65h 17/20

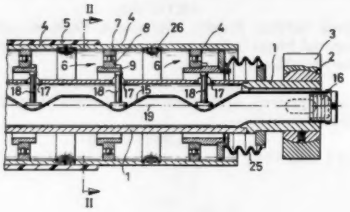
U.S. Cl. 226—191 32 Claims

1. A pressure-balanced guide roller assembly adapted for the conveyance of wide webs, comprising in combination:

a non-rotating, substantially rigid head traverse extending centrally through the entire length of the roller assembly and connected to a frame-support on each end thereof;

a plurality of roller segments arranged axially adjacent to one another on the head traverse so as to form an outwardly substantially continuous, generally cylindrical roller assembly for contact with a running web or the like;

an independent bearing unit rotatably supporting each roller segment, each bearing unit including a non-rotating sleeve surrounding the head traverse;



means for adjustably positioning each bearing unit relative to the head traverse, including means for radially biasing each bearing unit and its roller segment in opposition to the contact pressure exerted by the web against the roller assembly; and

means for restraining the adjustment displacements of each bearing unit to motions of the bearing unit center along only a single displacement path within a radial plane.

3,854,647

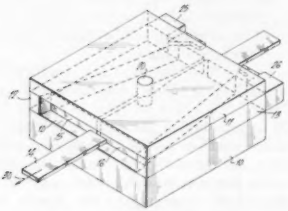
SELF-ADJUSTING STOCK CENTRALIZER

Jean H. Mittendorf, 82 Pawnee Ave., Oakland, N.J. 07436

Filed Feb. 11, 1974, Ser. No. 441,370

Int. Cl. B65h *23/28*

U.S. Cl. 226—198 **7 Claims**



1. A self-adjusting guide assembly for center alignment of elongated work pieces comprising:

a. a base for supporting all the components of the guide;

b. a cover secured to the base;

c. a pair of spaced, fixed guides mounted between the cover and base and formed with inner sloping edges for defining a wedge shaped space therebetween;

d. a pair of slidable aligning plates positioned in the space between the guides; said plates formed with outer sloping edges to engage the inner sloping edges of the guides;

e. an alignment pin secured to the cover and depending therefrom to engage the inner edges of the aligning plates, and

f. resilient means disposed between the aligning plates and the base for urging the aligning plates along the guide rods to yieldably hold a work piece in the aligning plates.

3,854,648

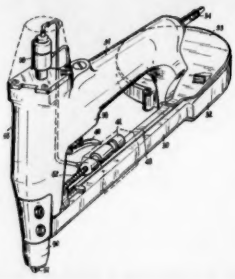
AIR OPERATED FASTENER DRIVING TOOL, ESPECIALLY FOR TACKS

Giovanni Inzoli; Enrico Arosio, and Stefano Iarrera, all of Via Don Minzoni 21, Bresso, Italy

Filed Oct. 4, 1972, Ser. No. 294,865

Int. Cl. B25c *1/04*

U.S. Cl. 227—136 **14 Claims**



1. A fastener driving tool, for driving tacks connected to each other at the head end to form a flexible band, comprising cylinder means having opposite ends; a piston arranged in said cylinder means reciprocable between an active stroke toward one end of said cylinder means and a return stroke; a rod-shaped driver coaxially fixed at one end to said piston and projecting therefrom toward said one end of said cylinder means; a magazine for receiving the tacks connected to each other in the form of a flexible band; guide channel means extending between and connected to said magazine and said one end of said cylinder means for guiding the band in longitudinal direction from said magazine to said one end of said cylinder means; feed means movable between a feed stroke and a return stroke for placing at the end of the feed stroke the leading tack on the band in a position coaxial with the other end of said driver; actuating means for first actuating said feed means on its feed stroke and then said piston on its active stroke so that the driver will shear off the leading tack from the band and drive the tack into material adjacent said one end of said cylinder means; and means directly engaged by and cooperating with said feed means for closing part of said guide channel means at the end thereof adjacent said one end of said cylinder means to prevent the sheared off tack from returning into the feed channel means and to prevent also further movement of the band during shearing off the leading tack therefrom.

3,854,649

THIN-WALLED CONTAINER

Ulrich Wagner, Esslingen; Eugen Scherr, Ebersbach, and Karl-Dieter Fuchslocher, Esslingen, all of Germany, assignors to Wilhelm Wagner, Esslingen, Germany

Filed Aug. 7, 1972, Ser. No. 278,380

Claims priority, application Germany, Aug. 6, 1971, 2139588

Int. Cl. B65d *1/00*

U.S. Cl. 229—3.5 MF **9 Claims**

1. In a two-part thin-walled metal container for storing and serving prepared food, said container being of the type that has a receptacle and a lid removably secured thereto for covering the same, the improvement comprising,

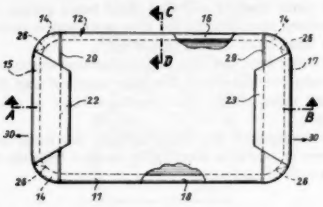
A. a continuous flange forming part of said receptacle and having

1. two straight, opposed, parallel first flange zones which serve as guide rails for guiding the removal of said lid from said receptacle,

2. two opposed second flange zones,
3. rounded corner zones, each connecting a first flange zone with a second flange zone,

B. a continuous edge zone forming part of said lid and bent about said continuous flange to form a continuous crimp and

c. a pull tab formed integrally with and as a continuation of each of those portions of the crimped continuous edge zone of said lid that lies beneath said second flange zones

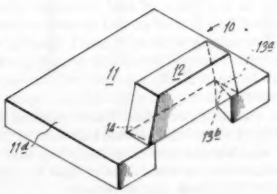


of the receptacle flange and having a base portion connected to the part of the crimped continuous edge zone that lies beneath the corner zones flanking its respective second flange zone; upon exerting a manual pulling force on both said pull tabs, the adjacent crimp portion about the associated second flange zone and about the flanking corner zones being disengaged to an extent that said lid being adapted to be slid relative to said first flange zone guide rails and removed from said receptacle.

3,854,650
CUSHION

Shigeru Hanaue, Yomato, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 11, 1973, Ser. No. 359,317
Claims priority, application Japan, May 24, 1972, 47-60773
Int. Cl. B65d *81/04, 85/30*
U.S. Cl. 229—14 C **15 Claims**

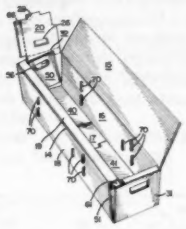


1. A foldable packing cushion comprising a flat part and at least a first standing part of resilient material, the standing part being hinged to the flat part, at least one of the standing and flat parts having a projecting, generally trapezoidal shaped tab which engages within a similarly shaped recess in the other of the standing and flat parts prior to being folded, the standing and flat parts each having a set of corresponding, orthogonally related edges which are initially compressed and then engaged with each other when the standing part is bent substantially perpendicular with the flat part during folding whereby the engagement of the corresponding edges maintains the perpendicular relationship of the flat and standing parts after being folded.

3,854,651
LOIN AND BUTT BOX

Edward L. Osborne, Kansas City, Kans., assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 22, 1973, Ser. No. 334,563
Int. Cl. B65d *5/24*
U.S. Cl. 229—34 R **3 Claims**



1. A blank of cut and scored paperboard or the like suitable for use in forming a container comprising:

a. a plurality of body forming panels foldably connected to one another along parallel fold lines and consisting of a top wall, rear wall, bottom wall and front wall;

b. a first pair of flaps located adjacent the ends of said top wall and separated therefrom by a pair of first cut lines, each of said first flaps including a first locking tab along an edge thereof;

c. a second pair of flaps foldably attached to the ends of said rear wall along a pair of single fold lines and to the adjacent edges of said first pair of flaps along a pair of spaced apart fold lines;

d. a pair of slots formed at the blank outer edges in the region of said spaced apart fold lines, said slots extending at least between said spaced apart fold lines;

e. a third pair of flaps located adjacent the ends of said bottom wall and separated therefrom by a pair of second cut lines said third pair of flaps being foldably attached to the adjacent edges of said second pair of flaps along a pair of single fold lines and including along said fold lines a pair of locking tab receiving slots;

f. a fourth pair of flaps foldably attached to the ends of said front wall and separated from the third pair of flaps by a pair of third cut lines and including along said cut lines a second pair of locking tabs cut from the adjacent pair of third flaps and,

g. a top wall supporting flap foldably attached to the free edge of said front wall, said top wall supporting flap including a pair of retaining tabs foldably attached to each end thereof said retaining tabs being dimensioned to fit within and be retained by the slots formed at the blank outer edges.

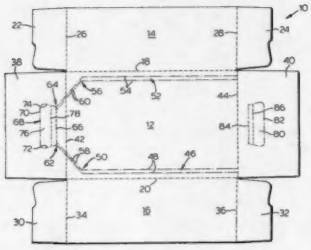
3,854,652
BLANK FOR CONTAINER COVER

Warren A. Brackmann, Cooksville, Ontario; Arthur K. Bunnell, and Karel Hrboticky, Etobicoke, Ontario, all of Canada, assignors to Carling O'Keefe Limited, Toronto, Ontario, Canada

Filed Feb. 7, 1973, Ser. No. 330,197
Int. Cl. B65d *5/54, 5/48*
U.S. Cl. 229—43 **7 Claims**

1. An integrally formed blank for a disposable cardboard sleeve comprising a rectangular center panel having first and second longitudinal side edges and first and second lateral side edges, a first rectangular side panel having a longitudinal side edge coextensive with one of said longitudinal side edges of said center panel and joined thereto by a first crease line, a scond rectangular side panel having a longitudinal side edge coextensive with the other of said longitudinal side edges of said center panel and joined thereto by a second crease line,

said first and second rectangular side panels each having first and second lateral side edges and a free longitudinal side edge, a first rectangular end panel having a longitudinal side edge coextensive with one of said lateral side edges of said center panel and joined thereto by a third crease line, a second rectangular end panel having a longitudinal side edge coextensive with the other of said lateral side edges of said center panel and joined thereto by a fourth crease line, each of said rectangular end panels having a free longitudinal side edge and free lateral side edges, a first pair of flaps each of which has a side edge coextensive with one lateral side edge of said first rectangular side panel and joined thereto through a fifth crease line, a second pair of flaps each of which has a side edge coextensive with one lateral side edge of said second rectangular side panel and joined thereto through a sixth crease line, the lateral width of said side panels and the lateral width of said end panels being substantially equal, and first and second laterally spaced apart scorings in said center panel and one of said end panels, each of said scorings extending from one lateral side edge of said center panel to the other, at least a substantial length of one of said scorings extending adjacent and substantially parallel to one longitudinal side edge of said center panel and at least a substantial length of the other of said scorings extending adjacent and substantially parallel to the other longitudinal side edge of said center panel, the scorings terminating in said one of said end panels and being joined together by a third scoring in said one of said end panels.



3,854,653

VACUUM TIGHT PLASTIC SHEET ENVELOPE

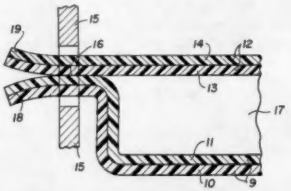
Herbert Engelsberger, Viersen, Germany, assignor to Feldmuhle Anlagen-und Produktionsgesellschaft mit beschrankter Haftung, Dusseldorf-Oberkassel, Germany

Filed Nov. 8, 1973, Ser. No. 413,920

Claims priority, application Germany, Nov. 10, 1972, 2255026

Int. Cl. B65d *5/54, 5/70, 17/00*

U.S. Cl. 229—51 R **6 Claims**



1. A vacuum-tight envelope comprising:

a. first and second laminar plastic sheets having each a central portion and an edge portion extending about the central portion in a closed loop;

b. each sheet having an outer layer and an inner layer bonded to said outer layer;

c. said central portions being spacedly superposed in such a manner that said inner layers of said central portions bound a pocket therebetween;

d. said edge portions being contiguously superposed;

e. an elongated weld integrally connecting said inner layers of said edge portions in a closed loop sealing said pocket;

f. respective lug parts of said edge portions extending beyond said weld away from said pocket and being movable relative to each other;

g. the breaking strength and tear propagation resistance of the outer layer of said first sheet being greater than the breaking strength and the tear propagation resistance of the inner layer of said first sheet;

h. the inner layers of said first and second sheets consisting of ethylene polymers, the inner layer of said first sheet being more brittle than the inner layer of said second sheet;

i. the strength of the bond between the inner and outer layers in said first sheet being smaller than the breaking strength of said weld.

3,854,654

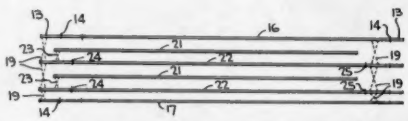
ENVELOPE ASSEMBLY WITH REMOVABLE TRANSFER SHEETS

Edmund G. Van Malderghem, Lewiston, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Feb. 27, 1973, Ser. No. 336,351

Int. Cl. B65d *27/10*

U.S. Cl. 229—69 **5 Claims**



1. An assembly of stuffed envelopes interconnected along transverse lines of weakening, front and back plies closed on all sides forming each envelope, insert material and transfer material within each envelope, a first removable tear strip at one end of said envelope including a portion of said insert material, said transfer material being attached to said portion of said insert material, said insert material being removably connected to a portion of said envelope whereby, upon removal of said first tear strip, said transfer material is extracted from said envelope while said insert material remains within said envelope, a second removable tear strip on said envelope, said plies being sealable together at said second strip, said insert material having an edge defined upon the removal of said first tear strip, and said insert material edge extending into and lying within said second tear strip so that, upon movement of said second tear strip including said insert material edge away from the remainder of said envelope, said insert material is freed from said envelope.

3,854,655

CONTAINERS FOR BANKNOTES AND THE LIKE

John Hugh Gerald Armstrong, Tower Court, Tower End, Victoria Rd., Freshfield, England

Filed July 19, 1973, Ser. No. 380,865

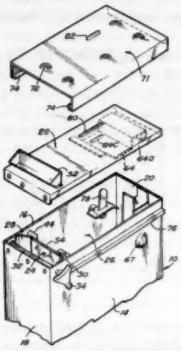
Claims priority, application Great Britain, July 28, 1972, 35312/72

Int. Cl. A47g *29/00*

U.S. Cl. 232—4 R **16 Claims**

1. A container for storing substantially planar, resilient articles comprising means defining a reception chamber for receiving articles to be stored, means defining a storage chamber for storing such articles, means forming a constriction between the reception and storage chambers of width less

than that of the smallest article to be handled, and a plunger means for forcing an article in the reception chamber through the constriction whereby it is caused to bow in passing through the constriction into the storage chamber, the arrangement



being such that on passing beyond the constriction and into the storage chamber the article is permitted to straighten out to restrict its return through the constriction when the plunger is subsequently retracted.

3,854,656

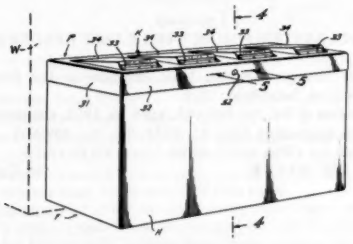
POSTAL DROP BOX

Bill H. Bishop, 1111 S. Post Oak, Houston, Tex. 77027, and Jack R. Shaw, Magnolia, Tex. 77355

Filed Sept. 11, 1972, Ser. No. 287,895

Int. Cl. B65d *91/00*

U.S. Cl. 232—27 **7 Claims**



1. A postal drop-box, comprising:

a generally rectangularly-shaped framework formed into a plurality of compartments disposed lengthwise side-by-side, each of which is adapted to receive a mail bag;

a housing enclosing said framework on the front and sides and secured thereto for preventing access to said compartments from the front and sides of said framework;

means for mounting said framework on the wall of a building for closing off the back of said framework and with the bottom close to the floor to prevent access thereto;

a cover having hinge means therewith secured to said framework and closing said top of said framework to prevent access to said compartments when said cover is secured to said housing;

said cover having a limited access slot for each of said compartments for the entry of mail but restricted in size to prevent retrieval of mail therethrough from said compartments; and

said means for mounting said framework on the wall including a mounting bracket adapted to be secured to a wall and having a pocket therein which is open at its upper end, and a rear framework section to which said hinge means is connected and having at least portions of said section adapted to drop into said pocket to prevent its movement downwardly or outwardly from the wall to thereby support the entire drop-box on the wall while permitting pivoting of said cover to and from its open and closed positions.

3,854,657

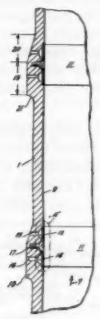
DRUM FOR A CENTRIFUGE

Kurt Pause, Grevenbroich; Ernst Ullrich Dregger, Neuss, and Gottfried Otten, Grevenbroich, all of Germany, assignors to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany

Filed Apr. 23, 1973, Ser. No. 353,719

Int. Cl. B04b *7/16*

U.S. Cl. 233—2 **5 Claims**



1. A centrifuge drum for a discontinuously operating centrifuge, particularly for separating a liquid phase from a fine fiber solid phase, said drum having an upper and a lower end and being provided with a circumferential wall having an outer side and a smooth cylindrical inner side and provided with a plurality of screen zones having perforations communicating with the interior of said drum; and a plurality of asymmetric reinforcements provided at said outer side of said drum wall in the region of said screen zones and each comprising a first section tapering upwardly and inwardly with respect to said drum wall and provided with at least one channel communicating with the interior of said circumferential wall, a second section extending downwardly and parallel with respect to said drum wall from substantially midway of the respective screen zone downwardly below the lower edge of the respective screen zone, merging with said drum wall abruptly via a small rounded portion, and provided with at least one channel communicating with the interior of said drum wall.

3,854,658

SOLID BOWL CONVEYER TYPE CENTRIFUGE

Helmuth Probstmeyer, South Norwalk, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed May 7, 1973, Ser. No. 357,929

Int. Cl. B04b *1/20, 15/06*

U.S. Cl. 233—7 **9 Claims**

1. A horizontal solid bowl type centrifugal machine adapted to separate a slurry representing a liquid-solids feed mixture into an overflow fraction of centrifugally separated liquid, and a concentrated solids fraction of moist cake consistency, which comprises an external solid bowl having a cylindrical wide end portion providing at the outer end thereof the overflow for said separated liquid fraction, and having a conically constricted end portion extending from the inner end of said cylindrical portion, and providing at the outer narrow end

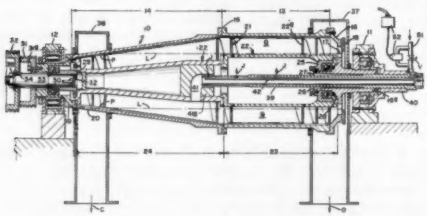
thereof for the discharge of said solids fraction, each end of said solid blowl having a hollow trunnion,

main bearing means for rotatably supporting said solid bowl, which in turn comprise a first main bearing for the trunnion at the wide end of said bowl, and a second main bearing for the trunnion at the narrow end thereof, coaxial with said first main bearing,

a conveyor scroll having a hollow core member concentric with said bowl, extending from end to end thereof, said core member comprising a wide section surrounded by the wide portion of the bowl, and a constricted section surrounded by the conical section of the bowl, scroll conveyor means on said core member, extending substantially from end to end thereof, and cooperating with the surrounding bowl in moving with said solids fraction towards delivery from said narrow end, while the liquid overflows from the opposite end, said core member further having an intermediate transverse partition located about midway between the ends thereof, and further having a radially outwardly directed feed passage opening located at the side of the partition facing said narrow end, and further having radially outwardly directed auxiliary openings located at the opposite side of said partition,

a pair of auxiliary bearings supporting the respective ends of said core member for rotation relative to the surrounding bowl,

differential drive means for rotating said bowl and said conveyor scroll at a speed differential adapted to move said solids fraction for delivery to said constricted end,



while said liquid fraction overflows from said wide end of the bowl,

a stationary pipe assembly presenting a substantially cylindrical outer surface, extending coaxially through the trunnion in said first main bearing and through the associated auxiliary bearing into said core member and through said partition, said pipe assembly comprising a slurry feed pipe for delivery of said feed mixture to said discharge opening beyond said partition into the surrounding portion of the solid bowl, and a flush pipe co-extensive and unitary combined with said feed pipe in fixed relationship therewith, and having an outer end portion at the wide end of the bowl, provided with means for connecting said flush pipe to a supply of a flushing fluid, support structure located outwardly from said first main bearing in fixed relationship therewith, for fixedly supporting the outer end portions of said pipe assembly axially aligned with the machine, said pipe assembly normally extending from said support structure through the adjacent trunnion in the adjacent main bearing, and the associated auxiliary bearing, and adapted to be retracted in axially outward direction from said support structure and from said machine, said pipe assembly furthermore being so constructed and arranged that flush fluid is emitted from at least one point of said pipe assembly into said wide section of the core member independently of the passage of slurry through the slurry pipe,

and means for controlling the admission of flushing fluid into said auxiliary pipe.

3,854,659

FREQUENCY SELECTIVE CIRCUIT ARRANGEMENTS

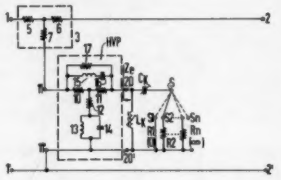
Erwin Bucherl, Munich, and Walter Peters, Taufkirchen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 30, 1973, Ser. No. 383,992

Claims priority, application Germany, July 31, 1972, 2237578

Int. Cl. H03h *7/10, 7/14*

U.S. Cl. 333—28 R **6 Claims**



1. A frequency selective circuit arrangement for use as an adjustable correcting device, in which a resistor network is provided for connection between a signal supply line and an auxiliary four-terminal network connected to a reference potential and the attenuation of said correcting device is varied by adjustment of the terminating impedance of said four-terminal network, the self-capacitance C_r and the supply line inductance L_z of a variable terminating resistance R_a being compensated by a reactive half-section filter combination having a series arm which contains a capacitor C_k having a capacitance equal to $1/\omega m^2 L_z$ and a shunt arm which contains a coil L_k having an inductance equal to $1/\omega m^2 C_r$, said filter combination being arranged in such manner that said coil is connected nearest to said four-terminal network, and fm, which equals $\omega m/2\pi$, signifies the variation middle frequency.

3,854,660

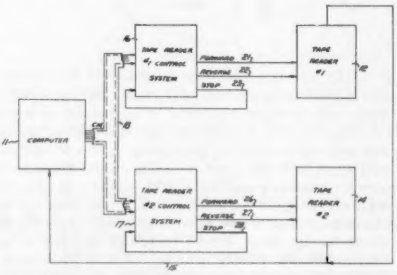
CONTROL SYSTEM FOR MULTIPLE TAPE READERS IN AN N/C SYSTEM

Hubert B. Henegar, Detroit, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Continuation of Ser. No. 249,445, April 26, 1972, abandoned. This application Sept. 21, 1973, Ser. No. 399,600

Int. Cl. G06k *13/00;* **G06f** *15/46;* **G11b** *15/00*

U.S. Cl. 235—61.11 R **10 Claims**



1. In a numerical control system having a data storage medium for receiving data from coded records through a plurality of selectively actuated tape readers, a tape reader control system for selectively controlling said tape readers so that one of said tape readers can be actuated to supply data to said storage medium simultaneously with the rewinding of another of said tape readers and the deactuation of the re-

maining of said tape readers, said tape reader control system comprising:

first means receiving particular command signals for selectively generating an enable signal and a disable signal in response to said command signals, said enable signal placing a tape reader in condition for receiving other commands and said disable signal prevents a tape reader from receiving other commands;

second means receiving other particular command signals for selectively generating forward and reverse signals in response to said other command signals;

third means receiving tape channel perforation signals for providing actuating signals indicating channel perforation conditions of a tape passing through one of said tape readers; and

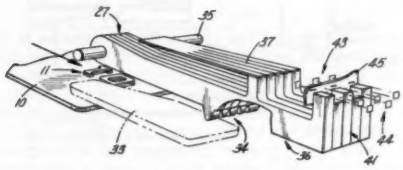
fourth means for generating a stop signal, said fourth means receiving said disable signal, said reverse signal and the output of said third means as enabling signals so that said stop signal is generated upon the failure of any one of said enabling signals to thereby effect the disabling of said tape reader.

3,854,661

EMBOSSED CHARACTER SENSING DEVICE

Charles F. Weber, and Carl W. Sherman, both of Euclid, Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Feb. 2, 1973, Ser. No. 329,270
Int. Cl. G06k *7/10*
U.S. Cl. 235—61.11 E **8 Claims**



1. A device for sensing embossed indicia on the surface of data cards, comprising in combination:

a sensing head frame;

means for supporting said data cards;

means mounting said head frame for a universal movement relative to said means for supporting said data cards;

means for causing relative scanning movement between said sensing head frame and said data cards;

guide means carried by said sensing head frame for riding a card on said means for supporting said data cards and for tracking the sensing head frame along a row of embossed indicia on a card for causing alignment of said sensing head frame with said row of indicia, and

means urging said sensing head frame in a direction toward a data card and across the said row of embossed indicia.

3,854,662

HUMIDIFIER FOR SAUNA ROOMS

Sven-Olof Janson, Fredagsgrand 13, S-302 53 Halmstad, Sweden

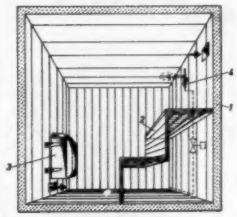
Continuation of Ser. No. 270,764, July 11, 1972, abandoned. This application Feb. 6, 1974, Ser. No. 440,114
Claims priority, application Sweden, July 13, 1971, 9046/71
Int. Cl. B01f *3/02*
U.S. Cl. 236—44 C **2 Claims**

1. In combination, a sauna room, means for heating the atmosphere therein and means for humidifying said atmosphere, said humidifying means comprising;

1. a water supply conduit,

2. a first valve in said supply conduit for controlling the flow of water therethrough,

3. a nozzle connected to said supply conduit adapted to disperse water as a fine mist into the sauna room atmosphere, and



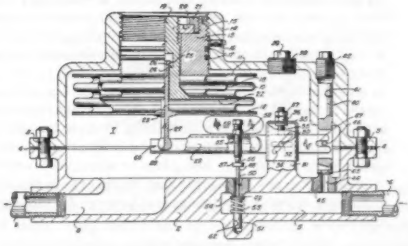
4. a thermostatic valve having a valve member intermediate said first valve and said nozzle and adapted to maintain the nozzle closed when the temperature of the atmosphere in the sauna room is below a predetermined valve.

3,854,663

CONSTANT DENSITY REGULATOR

Fred L. Goldsberry, Dallas, Tex., assignor to Lone Star Gas Company, Dallas, Tex.

Filed Oct. 2, 1972, Ser. No. 293,821
Int. Cl. G05d *23/12*
U.S. Cl. 236—92 C **11 Claims**

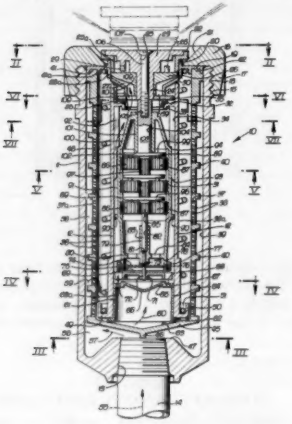


1. In a regulator, a hollow housing having an inlet for high pressure fluid and an outlet for low pressure fluid; an outwardly opening first valve in the housing openable toward the inlet; spring means biasing the first valve toward closed position; an inwardly opening second valve controlling admission of high pressure fluid from the inlet to the interior of the housing; a sealed control bellows diaphragm in the housing; actuating means contacting one end of the bellows arranged to move each valve off its seat upon expansion of the bellows; adjustable means in the housing contacting the other end of the bellows arranged to be moved inwardly and outwardly of the housing to adjust the contraction of the bellows; the exterior of the bellows being in constant communication with the outlet; a fulcrum arm pivotally mounted between the first and second valves, arranged to be pivoted about the pivot point therefor upon expansion of the bellows to cause simultaneous opening of the first and second valves; means to adjust the pivot point longitudinally with reference to the first and second valves.

3,854,664
SPRINKLER SYSTEMS

Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, San Marcos, Calif.

Continuation of Ser. No. 346,445, March 30, 1973, abandoned. This application Oct. 11, 1973, Ser. No. 405,690
Int. Cl. B05b *3/16*
U.S. Cl. 239—206 20 Claims



1. In a sprinkler system having fluid under pressure flowing therethrough, and a sprinkler head operatively connected to said system having a nozzle for dispersing said fluid therefrom, the improvement which comprises:

impeller means associated with said head operatively engaging said nozzle for rotating said nozzle in response to said fluid passing through said system, said impeller means including transmission means for transmitting movement of said impeller to said nozzle, said transmission means being sealed off from engagement by said fluid at one end by an expandable diaphragm separating said transmission means from said fluid and closed-off in a fluid-tight manner at the other end and a lubricating medium completely filling the sealed-off portion of said transmission means, said lubricating medium being free to selectively contract or expand thereby displacing said diaphragm in response to varying ambient conditions encountered by said sprinkler head.

3,854,665
OSCILLATING SPRINKLER WITH SNAP-IN NOZZLE STRIP

J. Linn Rodgers, 9606 La Serna Dr., Whittier, Calif. 90605

Filed Feb. 7, 1974, Ser. No. 440,376
Int. Cl. B05b *1/04, 1/20, 3/14*
U.S. Cl. 239—242 8 Claims

1. In a liquid sprinkler of the type having:

a hollow conduit having two ends and an opening at at least one of said ends for attachment to a source of supply of liquid and containing a bowed section between said ends, provided with nozzle holes along its length through which streams of liquid are ejected, said conduit being adapted to be oscillated in rotary motion about an axis coaxial with said ends,

the improvement comprising:

an open slot along the convex side of said bowed section, the opposite sides of said slot each having a bevelled groove along its length;

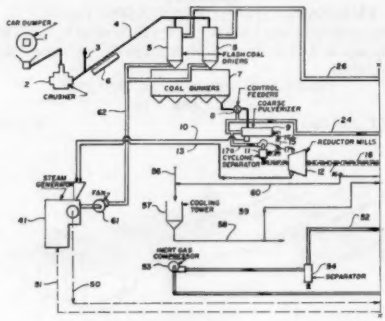
a strip dimensioned to close said slot; said strip having bevelled sides adapted to snap into the bevelled grooves of said slot;

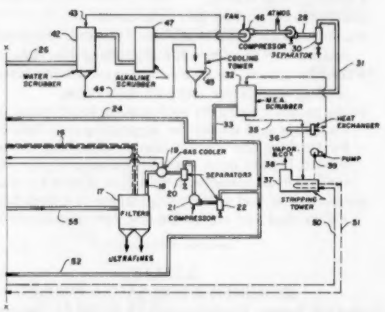
said strip being provided with a plurality of nozzle holes spaced along its length through which liquid within the conduit is ejected in streams all of which emerge from the conduit in a pattern substantially in one plane.

3,854,666
PROCESS FOR PULVERIZING COAL TO ULTRAFINE SIZE

George W. Switzer, Jr., Reading, Pa., assignor to Gilbert Associates, Inc., Reading, Pa.

Filed Jan. 29, 1973, Ser. No. 327,877
Int. Cl. B02c *21/00*
U.S. Cl. 241—18 15 Claims





1. A process of pulverizing coal to ultrafine size of a few microns, comprising conveying the coal through pulverizing means together with an inert gas, separating the pulverized ultrafine size coal from said inert gas, cooling and recycling said inert gas through said pulverizing means, producing makeup inert gas by scrubbing boiler flue gases to remove particulate matter and carbon dioxide, thereby leaving essentially nitrogen inert gas, and introducing said makeup inert gas in said pulverizing means.

3,854,667

APPARATUS FOR PULPING AND GRADING OF WASTE PAPER

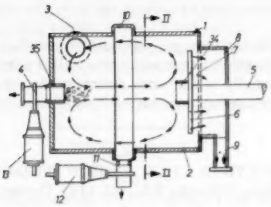
Theodor Baehr, and Helmut Thumm, both of Heidenheim Brenz, Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany

Filed July 16, 1973, Ser. No. 379,578

Claims priority, application Germany, July 31, 1972, 2237521

Int. Cl. B03b *1/00*

U.S. Cl. 241—46.11 7 Claims



1. In an apparatus for pulping and grading of waste paper which may be admixed with matter having low specific gravity, a combination comprising a receptacle adapted to accommodate a waste paper suspension and having a peripheral wall; rotor means having an axis of rotation and located in said receptacle adjacent one portion of said wall for shredding the waste paper in said suspension so as to obtain a pulp; first outlet means in said wall in the region of said rotor means for discharge of the pulp; second outlet means in another portion of said wall opposite to said one portion and extending transversely of said axis and substantially concentric thereto for discharging of matter having low specific gravity; and a tubular sleeve provied on said rotor means substantially concentric with said axis and said second outlet means and operative for directing and centering a vortex core of suspension which is being agitated by said rotor means.

3,854,668

WINDER LINKAGE

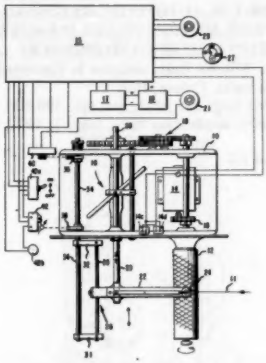
David William Rudd, Richmond, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 29, 1973, Ser. No. 364,924

Int. Cl. B65h *59/00*

U.S. Cl. 242—18 CS 1 Claim

1. In a machine for winding yarn packages that includes a frame, a rotating yarn support mounted to said frame driven by a motor having torque control means, a variable potentiometer connected to the torque control means for regulating the output of the control means during winding and a reciprocating arm pivotally mounted intermediate its ends to said frame and having a yarn guide on one end for guiding yarn onto said support in a controlled manner, said yarn guide maintaining surface contact with the yarn package being wound, a linkage coupled between said arm and said potentiometer comprising: an elongated member slidably attached to said other end of the arm, said arm being free to reciprocate on said member; a shaft rotatably mounted to said frame, said shaft being attached at one end to said member and coupled to said variable potentiometer whereby upward displacement of said arm by an increase in package size causes downward



movement of said member for rotation of said shaft and movement of said variable potentiometer.

3,854,669

CARTRIDGE FOR ENDLESS COIL OF TAPE

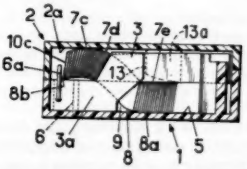
Serge Leon Louis Cailliot, Neuilly-sur-Seine, France, assignor to Georges Tcherkassky, Parc Saint-Maur, France

Filed Feb. 8, 1973, Ser. No. 330,588

Claims priority, application France, Feb. 11, 1972, 72.04699; Jan. 15, 1973, 73.01333

Int. Cl. B65h *17/48*

U.S. Cl. 242—55.19 A 5 Claims



1. Cartridge holding an endless coil of tape having an innermost turn encircling a central opening and an outermost turn, said turns being connected by a connecting loop extending over the remaining turns of said coil, said cartridge comprising a bottom part, a cover part, a stationary pillar means projecting upward from said bottom part, passing through the central opening in said coil, and holding said coil away from the peripheral wall of the cartridge, said pillar means having a portion of its upper peripheral surface which is inclined inwardly of said cartridge at a slight angle to a perpendicular to said bottom, said portion constituting an abutment surface about which said connecting loop is bent away from said innermost turn, supporting means on the same side of pillar means as said inclined surface, said supporting means defining a narrow surface generally parallel to said cover part which confines a first section of said coil at a first level between said narrow surface and said cover part, and guide means on the opposite side of said pillar means from said supporting means and defining a narrow surface spaced from the top of said cartridge which confines a second section of said tape at a second level between said surface on said guide means and said bottom part, with the upper surface of said second coil section lying slightly below the lower surface of said first coil section so that said connecting loop may pass substantially untwisted across said second coil section, said tape having a

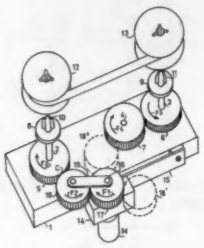
stiffness sufficient to provide for said coil to rotate in either direction within said cartridge when said connecting loop is friction driven in that direction.

3,854,670

DEVICE FOR THE AUTOMATIC REVERSAL OF THE LENGTHWISE MOTION OF THE INK-RIBBON IN TYPEWRITERS AND PRINTERS

Ugo Bertolazzi, Milano, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy

Filed Aug. 22, 1973, Ser. No. 390,535
Claims priority, application Italy, Sept. 1, 1972, 28733/72
Int. Cl. B65h *17/02*
U.S. Cl. 242—67.4 **4 Claims**



1. A printing device, including a first take-up spool mounted on a first shaft; a second take-up spool mounted on a second shaft; a base plate supporting said shafts; an ink ribbon extending from one spool to the other spool and adapted to be wound on one spool and unwound from the other spool and vice versa; and drive means for alternately driving a first driven gear coupled to drive said first shaft and a second driven gear coupled to drive said second shaft, said drive means comprising:

a driving gear;

said first driven gear;

said second driven gear;

a planetary gear engaged with said driving gear and arranged for alternately engaging said first and said second driven gear by planetary rotation about said driving gear; and

elastic support means for supporting said driving gear on said base plate to permit relative displacement of said driving and driven gears in response to an increase in resistant torque applied to one of the driven gears engaged by said planetary gear, whereby said planetary gear is permitted to disengage from one of said driven gears, rotate about said driving gear, and engage the other of said driven gears.

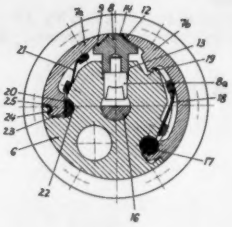
3,854,671

REEL FOR COILING STRIP

Alexander Rodach, Pforzheim, Germany, assignor to Frau Irma Ungerer geb. Dollinger, Pforzheim, Germany

Filed Feb. 16, 1973, Ser. No. 333,061
Claims priority, application Germany, Apr. 6, 1972, 2216554
Int. Cl. B65h *75/28*
U.S. Cl. 242—74.1 **8 Claims**

1. A reel for coiling strip, which comprises first and second expansible shell portions each having a free end and each of said shell portions extending peripherally from said free end disposed adjacent to the other shell portion to a pivoted end, an expanding and clamping bar, which engages said free end of said first shell portion and clamps a strip end portion against said free end portion of said first shell portion and which is radially outwardly movable to expand said shell portions, and a bearing, in which said pivoted end of said second shell portion is mounted and which limits said second shell portion to perform a pivotal movement and a movement substantially in the direction in which said bar is radially movable,



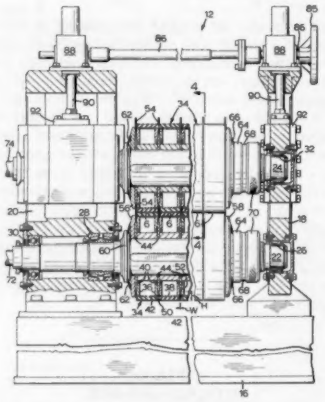
said bar being engaged with said free end of said second shell portion so that said second shell portion is moved substantially in the same direction as said bar during a radially outward movement of said bar.

3,854,672

MULTIPLE CLUTCH STRIP TENSIONER

Ferenc Tilban, 310 Niska Rd., Apt. 1103, Downsview, Ontario, Canada

Filed Feb. 21, 1973, Ser. No. 334,302
Int. Cl. B65h *23/14*
U.S. Cl. 242—75.2 **4 Claims**



1. A tensioner for tensioning a plurality of parallel side by side strips, comprising:

1. a pair of parallel spaced shafts,
2. a plurality of roller rings rotatably mounted on each shaft, one ring on each shaft for each strip to be tensioned, said rings each having outer circumferential friction facings, said shafts being spaced to support said roller rings of one shaft adjacent and opposed to the facings of corresponding rings of the other shaft, for said strips to pass therebetween,
3. friction means connected between each said shaft and said roller rings thereof for controllably limiting rotation of said roller rings of each shaft relative to such shaft, said friction means comprising friction discs keyed to each said shaft for axial movement thereon, one friction disc being located between each adjacent pair of roller rings and said friction discs being of lesser diameter than said roller rings, said friction discs spacing said roller rings of

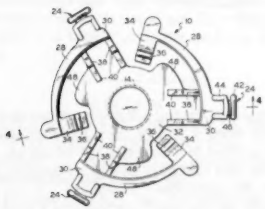
each shaft axially apart to provide axial spaces of predetermined width between the outer portions of said roller rings of each of said shafts,

4. a plurality of annular separator discs each of axial thickness less than said predetermined width, said separator discs having central apertures of diameter greater than that of said friction discs and less that that of said roller rings, said separator discs being mounted over said friction discs of one of said shafts between said roller rings thereof and being freely rotatable on such friction discs, said separator discs being slidable axially on said friction discs on which they are mounted but such axial movement of said separator discs being limited by the sides of such roller rings, said separator discs being of outer diameter greater than that of said roller rings and projecting into said spaces between the outer portions of said roller rings of the other of said shafts, to prevent sideways movement of said strips relative to said roller rings while reducing drag on the edges of said strips,
5. means for controllably compressing said roller rings and friction discs of each shaft axially to limit rotation of said roller rings of each shaft,
6. and common means for limiting rotation of each shaft.

3,854,673
BOBBIN HOLDER FOR ATTACHMENT OF DIFFERENT SIZED BOBBINS TO A SPOOL

Eugene P. Manning, Gresham, Oreg., assignor to Kamre Corporation, Troutdale, Oreg.

Filed Aug. 14, 1972, Ser. No. 280,543
Int. Cl. B65h *75/02*; **B65d** *79/00*
U.S. Cl. 242—118.41 **12 Claims**



1. A bobbin holder apparatus in which the improvement comprises:

holder means for holding bobbins of different outside diameters including a plurality of resilient arcuate holder elements which are adapted to extend arcuately around a bobbin and bend to enable insertion and removal of the bobbin and which hold the bobbin on the holder means between said holder elements;

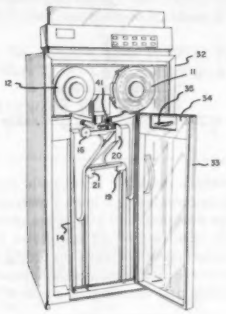
attachment means for releasably attaching said holder apparatus to one end of a spool of thread, including a support member which projects away from holder means and is adapted to extend into the central opening of said spool to position the holder means outwardly of said one end of said spool; and

said attachment means being formed integral with said holder means.

3,854,674
TAPE DRIVE UNIT WITH OFFSET BACKPLATE

Zoltan L. Herger, Northglenn; Thomas S. Kavanagh, Boulder; Dennis R. Olmsted, Westminster, and Ronald R. Campbell, Boulder, all of Colo., assignors to Storage Technology Corporation, Boulder, Colo.

Continuation of Ser. No. 139,708, May 3, 1971, abandoned. This application Aug. 17, 1973, Ser. No. 389,125
Int. Cl. B65h *59/38*; **G03b** *1/04*; **G11b** *15/32*
U.S. Cl. 242—182 **10 Claims**



1. A magnetic tape unit comprising:

a cabinet for said tape unit,

a file reel and a machine reel,

a magnetic head mounted intermediate said reels,

a capstan for driving magnetic tape in both directions past said head and between said reels,

means for threading said magnetic tape from said file reel to said machine reel,

a pair of tape vacuum buffer columns each having an open end disposed adjacent one of said reels on opposite sides of said magnetic head,

a guide positioned above the vacuum column adjacent said machine reel, said guide having a width which accommodates magnetic tape of normal width which guides said tape through said vacuum column during normal operation,

a back plate, said guide and said head being mounted on said back plate, said back plate having an offset portion which extends above said guide, said offset portion of said back plate forming one side of a threading guide which is wider than said width of said guide, said back plate being mounted in said cabinet so that said guide and said head are accessible through the open front of said cabinet,

a door for closing the front opening of said cabinet, and

a glass plate mounted on said door to form the other wall of said threading guide when said door is closed, said glass plate providing a relatively airtight seal between said vacuum columns and said back plate.

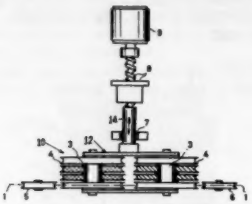
3,854,675
ROTARY ACCUMULATION DEVICE

Siefried H. Hunke, 268 Babbitt Rd., Thomaston, Conn. 06787

Filed Dec. 14, 1973, Ser. No. 424,867
Int. Cl. B65h *51/20*
U.S. Cl. 242—154 **7 Claims**

1. An accumulating device for selectively accumulating and discharging a line of material being longitudinally fed along a path of travel comprising a rotary accumulator, entry and exit guide means for feeding the line of material to and from the rotary accumulator, the rotary accumulator being rotatable about a first axis of rotation and having a plurality of stacks of a plurality of independently rotatable coaxial reels mounted for rotation about axes generally parallel to and radially offset from said first axis such that the rotatable reels are mounted

for planetary movement about said first axis, said stacks being spaced for initially threading the line of material between and passing the line of material partly around entry reels thereof, indexing means for relatively axially indexing in opposite axial directions the reel stacks and the entry and exit guide means in conjunction with the rotation of the rotor assembly whereby



the rotor assembly is rotatable in opposite angular directions for respectively accumulating a line of material and discharging it at both the entrance and exit of the rotary accumulator and respectively onto and off of successive reels of the reel stacks, and rotation control means providing for rotating the rotary accumulator in opposite angular directions for selectively accumulating and discharging a line of material.

3,854,676

RECORDING AND/OR PLAYBACK APPARATUS

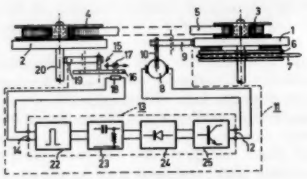
Walter Fischer, and Herbert Rutkowski, both of Vienna, Austria, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed Oct. 19, 1972, Ser. No. 299,147

Claims priority, application Austria, Oct. 22, 1971, 9151/71

Int. Cl. G11b *15/32*

U.S. Cl. 242—191 **3 Claims**



1. A recording and/or playback apparatus comprising two turntables for carrying thereon tape reels to transport magnetic tape therebetween, a motor connected to each turntable for driving same to take-up the tape on its respective turntable, means for energizing said motors said that one of said motors operates its turntable as a tape take-up turntable and the other turntable operates as a tape supply turntable when the tape is traveling in one direction and vice versa when the tape is traveling in the opposite direction, a tacho-generator connected to each turntable for producing a control signal proportional to the speed of its respective turntable, at least one control arrangement providing a control quantity to determine the speed of the motor operating the take-up turntable, change-over means for establishing a control circuit in accordance with the direction of the tape transport, said control circuit including the tacho-generator of the supply turntable connected to the input side of said control arrangement, and the motor of the take-up turntable connected to the output of said control arrangement so that the control signal of the tacho-generator of said established control circuit and an operating point of said control arrangement provides said control quantity to determine the speed of the motor in said established control circuit, and switching means for stopping tape travel connecting the motor of the supply turntable to the output of a control arrangement which produces a control quantity for providing a torque on said supply motor in a direction opposite to the instantaneous direction of rotation of said motor, and connecting one of said tacho-generators to the input of said control arrangement, the control signal of which is applied to said control arrangement for increasing the control quantity provided thereby, and a change over switch operated by said switch means for changing over said control arrangement to an operating point at which it cuts off supply energy to the motor connected to its output when the control signal applied to its input reaches a value which corresponds to standstill of the tacho-generator producing said signal, thereby stopping tape travel.

3,854,677

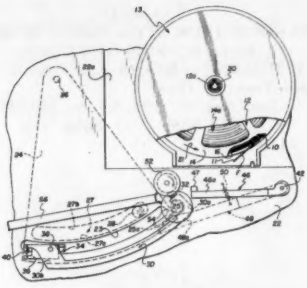
WEB FEEDING APPARATUS WITH GUIDE ARM

William Allen Martin, Fairport, and Richard Carleton Chesley, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 5, 1973, Ser. No. 337,996

Int. Cl. G03b *1/04*; **G11b** *15/32*

U.S. Cl. 242—195 **13 Claims**



1. Apparatus for feeding a leading end portion of a strip of web material from a roll of such material, said roll being rotatable in a plane in a direction for taking up web material onto said roll, and said strip having an opening in its leading end portion, the apparatus comprising:

a. a member having shank portion and a hook portion, the hook portion being engageable with said strip through said opening for feeding said strip of web material from said roll;

b. means mounting said member for movement between (1) a first position wherein said hook portion is separated from said roll, and (2) a second position wherein said hook portion is located in said plane adjacent said roll of web material for entering and opening in said strip to couple said hook portion to said strip in response to rotation of said roll in a take-up direction;

c. means coupled to said member for moving said member between said first and second positions; and

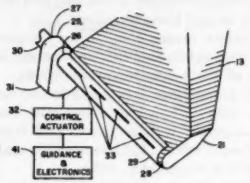
d. guide means selectively engageable with said member for guiding movement of said hook portion transversely relative to said plane of said roll and the direction of movement of said member during movement of said member from its first position to its second position so that said hook portion of said member is aligned with said opening in said web material when said member is in its second position, thereby to insure coupling of said hook portion of said member with said strip of web material during rotation of said roll in a take-up direction.

3,854,678

ROTARY VALVE JET FLAP CONTROL SYSTEM

Robert J. Geres, China Lake, Calif., assignor to The United States of America as represented by the Secretary of Navy, Washington, D.C.

Filed Sept. 17, 1973, Ser. No. 398,039
Int. Cl. F42b *25/24*
U.S. Cl. 244—3.16 3 Claims



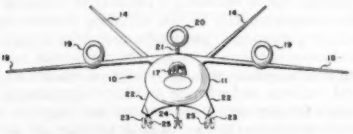
1. A control apparatus for use with an aerial missile the combination comprising:
guidance control means for said aerial missile;
a wing attached to said aerial missile;
aperture means positioned substantially adjacent the trailing edge of said wing and extending on either side of the center line of said wing;
hollow chamber means in communication with said apertures and having two rotatable substantially cylindrical tubes independently rotatable from each other;
attachment means at the inner and outer ends of said cylindrical tubes for attachment of said tubes to extend substantially along the entire length of the trailing edge of said wing and adjacent thereto;
control actuator means for selectively moving said cylindrical tubes through 360° in response to signals from said guidance unit; and
air passage means from said missile to said hollow chamber means;
whereby compressed gas from the missile is controlled by said guidance control to cause gas flow through said air passage into said hollow chamber and out through said apertures.

3,854,679

WATER-BASED AIRPLANE ESPECIALLY DESIGNED FOR ADAPTATION TO STOL

Rollo G. Smethers, Jr., Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Jan. 7, 1974, Ser. No. 431,574
Int. Cl. B64c *1/04*
U.S. Cl. 244—106 6 Claims



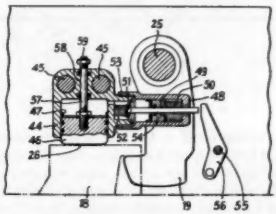
1. A multi-engine high performance airplane especially designed for adaptation to short take-off from and landing on water comprising an aerodynamically streamlined fuselage, a pair of spaced apart hulls extending along the underside of said fuselage, a pair of spaced apart booms extending from the aft end of said fuselage, each said boom terminating in an angularly disposed fin projecting outwardly therefrom whereby both booms constitute a V-tail for said airplane, a wing projecting from each side of said fuselage adjacent the top thereof, a jet engine mounted on top of each said wing and on said fuselage, the longitudinal dimension of such engines being substantially parallel one to the other and located so as to discharge exhaust in an aftward direction with the exhaust from each wing mounted engine passing on the remote sides of the tail fins aforesaid and the exhaust from the fuselage mounted engine passing between said fins.

3,854,680

DEVICE FOR STEADYING LOADS SUSPENDED FROM AIRCRAFTS

Jean Henri Hasquenoph, Lagny, and Pierre Fernand Coutin, Paris, both of France, assignors to R. Alkan & Cie, Valenton, France

Division of Ser. No. 366,054, June 1, 1973,. This application Mar. 7, 1974, Ser. No. 449,014
Int. Cl. B64d *1/02*
U.S. Cl. 244—118 R 2 Claims



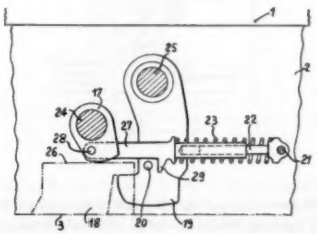
1. Device for steadying loads suspended from aircrafts, wherein fork-shaped hooks rigid with a carrier member of the aircraft co-act with bridge pieces with the load and having a flat top face, comprising a pair of wedge members associated with each fork-shaped hook and transversely disposed on the opposite sides of said hook, each wedge member consisting of a hydraulic piston sliding within a cylinder rigid with the carrier member of the aircraft and in a direction perpendicular to the top face of the bridge piece in order to engage said top face in response to a fluid under pressure supplied through a non-return valve.

3,854,681

DEVICE FOR STEADYING LOADS SUSPENDED FROM AIRCRAFTS

Jean Henri Hasquenoph, Lagny, and Pierre Fernand Coutin, Paris, both of France, assignors to R. Alkan & Cie, Valenton, France

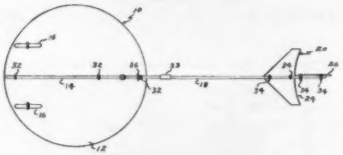
Division of Ser. No. 366,054, June 1, 1973,. This application Mar. 7, 1974, Ser. No. 449,015
Int. Cl. B64d *1/02*
U.S. Cl. 244—118 R 7 Claims



1. Device for steadying loads suspended from aircrafts, comprising a pair of fork-shaped hooks rigid with a carrier member of the aircraft and coacting with bridge pieces rigid with the load and having a flat top face, and a pair of wedge members associated with each fork-shaped hook on the oppo-

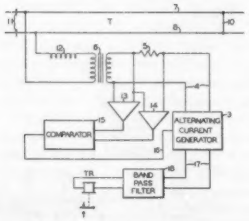
site sides thereof, each wedge member consisting of a cam member pivoted to a telescopic spring-urged rod and said cam member being forced by the spring associated with the corresponding telescopic rod to engage the top face of the bridge piece and to ensure the wedging of the load.

3,854,682
KITE ARRANGEMENT AND METHOD OF CONSTRUCTION
Bernard Lindenbaum, 4929 Thorain Ct., Dayton, Ohio 45416
Filed May 7, 1973, Ser. No. 357,568
Int. Cl. B64c *31/06*
U.S. Cl. 244—154 **4 Claims**



1. A kite, comprising: a flexible wing member of plastic foam material having a thickness less than three-eighths inch; a longitudinal spar secured to said wing member by means of tie wires; a horizontal tail member and a vertical tail member spaced from said wing member; means for connecting the horizontal tail member and the vertical tail member to said longitudinal spar; a bridle having three lines which meet to form a substantially Y-shaped bridle; means for securing two of said lines to the forward portion of the wing member at points laterally spaced from the longitudinal spar; said means for securing two of said lines to the forward portion of the wing member including a pair of bridle attachment bars, extending a predetermined distance over the surface of the wing member; means for connecting the third line to the longitudinal spar adjacent the rear portion of the wing member and a kite line connected to the bridle at the intersection of said three bridle lines.

3,854,683
DETECTOR TRACK CIRCUIT
Marcel Bieder, and Jean Leclert, both of Paris, France, assignors to Wabco Westinghouse, Freinville-Sevran, France
Filed Dec. 10, 1973, Ser. No. 423,176
Int. Cl. B61l *1/02*
U.S. Cl. 246—40 **10 Claims**



1. Track circuit apparatus for detecting trains occupying a section of railroad track, each rail of which forms a continuous electrical path from the near end to a distant end, comprising in combination,

a. a crossbond connected between said rails at said distant end,

b. a controllable frequency alternating current source having a basic frequency normal output,

c. a first impedance means connected to said rails at said near end to form a circuit path through said crossbond having a preselected inductive impedance at said basic frequency,

1. said first impedance means further connected for coupling said source to the circuit path including said rails,

d. a second impedance means connected in series with said source in said circuit path and having a constant value of impedance, at any frequency, selected to provide equal voltages across said first and second impedance at said basic frequency,

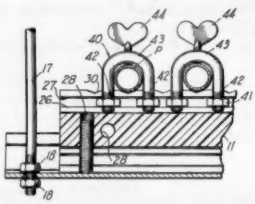
e. comparator means coupled for comparing the voltages developed across said first and second impedance means under all track occupancy conditions,

1. said comparator connected to said source for varying the output frequency from said basic frequency to equalize the voltages across said first and second impedances when a rail shunt within said section changes said first impedance, and

f. detection means coupled to said source to receive an output having the existing frequency, and responsive thereto for registering the unoccupied condition of said section only when the received output has said basic frequency,

1. said detection means registering an occupied condition of said section when said output has any other frequency.

3,854,684
SUPPORT BRACKET
Arvel H. Moore, 1505 Chattahoochee Ave., Atlanta, Ga. 30318
Filed Jan. 4, 1973, Ser. No. 320,903
Int. Cl. F16l *3/00*
U.S. Cl. 248—68 R **4 Claims**



1. Apparatus for use in supporting, spacing and aligning at least one elongated element in a set position comprising:

a. a base support means consisting of a support member having a recessed continuous receiving channel with a pair of receiving shoulders, said support means including a support surface having a plurality of element receiving recesses transverse to said channel; and

b. securing means including a plurality of retaining shoulders complementary to said receiving channel and said receiving shoulders operable for permitting adjustment of said securing means along said channel so that said securing means can be selectively aligned relative to one of said recesses, and wherein said securing means includes means for clamping at least one of said elements in a set position relative to one of said recesses on said base support means;

c. said base support means including a plurality of angularly disposed supporting surfaces with each surface including said receiving channel with said receiving shoulders for receiving said securing means;

d. said apparatus including a substantially U-shaped outer supporting channel comprising side walls and flanges depending from the terminal portion of said walls; said angularly disposed surfaces being of a size to permit said depending flanges to be received within said receiving shoulders so as to lockingly and sildably engage said outer supporting channel.

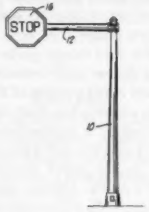
3,854,685
SIGNAL MASTARM BRACKET ASSEMBLY

Alfred P. Parduhn, Rt. 2, Box 33, Oklahoma City, Okla. 73114

Continuation-in-part of Ser. No. 231,131, March 2, 1972, Pat. No. 3,764,099. This application Aug. 20, 1973, Ser. No. 389,943

Int. Cl. F16m *13/02*

U.S. Cl. 248—214 **13 Claims**



1. A mastarm bracket assembly comprising:

an elongated mounting member adapted to supportingly receive a structure for providing a visual display of indicia;

track means on said elongated member;

track engaging means slidingly engaging said track means for sliding movement longitudinally along said elongated mounting member;

means for clamping the track means to the track engaging means to arrest the sliding movement of the track engaging means along the track means at a selected location therealong;

movable joint means secured to said track engaging means and projecting from the track engaging means in a direction substantially normal to the longitudinal axis of said elongated mounting member, said joint means including:

a first tubular section; and

a second tubular section telescopingly engaging the first tubular section for rotation on the first tubular section about an axis extending through, and common to, the first and second tubular sections;

means for selectively securing the second tubular section against rotation on the first tubular section at a desired point in the course of one complete rotation about said first tubular section;

a clamp plate secured to the end of said second tubular section opposite its end telescopingly engaged with the first tubular section;

at least one elongated flexible element having one end secured to said clamp plate; and

means for detachably securing the other end of said elongated flexible element to said clamp plate.

3,854,686
CANTILEVER RACK

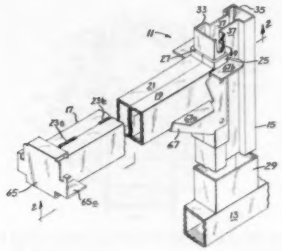
Anthony N. Konstant, Mt. Prospect, Ill., assignor to Speedrack Inc., Skokie, Ill.

Filed June 21, 1972, Ser. No. 264,784

Int. Cl. A47b *96/12*; **A47f** *5/01*, *5/16*

U.S. Cl. 248—243 **9 Claims**

1. A cantilever storage rack structure comprising an elongated vertical standard having a front surface, a pair of side surfaces extending rearward from said front surface and a re-entrant surface extending inward from the rear end of each of said side surfaces, and a cantilever support arm having an inner end for attachment to said standard so that it extends from said front surface thereof and an outer end that will be spaced from said standard, which arm includes a pair of elongated generally horizontal tubular members and means joining said elongated members together at at least spaced points generally adjacent said outer end of said support arm and thereby causing said elongated members to normally lie in contiguous relationship at said inner end of said support arm, and which support arm also includes a bracket affixed to the inner end of each of said elongated tubular members for attaching said support arm to said standard, said brackets each having a first flange portion for abutting said front surface of said standard when attached thereto, a second portion extending rearward from said first flange and a re-entrant flange element extending from said second bracket portion in the same direction as said first flange and generally abutting said re-entrant flange of said standard, said elongated members



being unconnected to each other for a substantial distance adjacent the inner end of said support arm and the free edges of said re-entrant flange elements being so spaced apart that, when one said flange element is located in contact with one said re-entrant surface of said standard and said cantilever arm is rotated, said tubular members are resiliently spread apart as a result of said rotation to an open condition and thereafter snap back together in partially circumscribing relationship about said standard at a location intermediate its upper and lower ends, said support arm tubular members even when loaded remaining in said snapped together condition without additional attachment.

3,854,687
MOUNTING FOR OPTICAL DEVICE

Erwin Sick, Stifterweg Icking, Germany, assignor to Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed July 16, 1973, Ser. No. 379,207

Claims priority, application Germany, Aug. 28, 1972, 2242266

Int. Cl. F16c *11/06*; **F16l** *27/00*

U.S. Cl. 248—276 **5 Claims**

1. Mounting for an optical device to be precisely adjusted on a fixed frame, in particular for an optical needle-checking device in circular knitting machines, comprising a spherical joint permitting movement in all directions as well as distance adjustment and rotation around the axis of said optical device, said joint having a ball connected with said optical device which is lockably and unlockably mounted on a fixed support having a hard socket supporting said ball on a circular ring comprised of two parts diametrically opposite with respect to

the center of the ball having an angular distance of approximately 90°, and there being provided a pressure plate which is substantially softer than said support pressing against said ball from the side opposite the support.

3,854,688

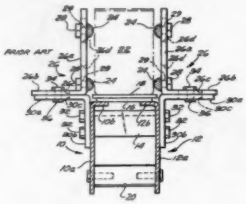
QUICK ADJUSTING GUIDE RAIL FOR CONVEYOR

Lloyd N. Shuford, 11 Middleboro Pl., Lynchburg, Va. 24502

Division of Ser. No. 285,671, Sept. 1, 1972. This application Oct. 4, 1973, Ser. No. 403,644

Int. Cl. E05d *7/04*; **F16l** *3/00*

U.S. Cl. 248—316 A **13 Claims**



1. An adjustable bracket structure effective to mount a pair of upstanding brackets on a support having a pair of vertical side walls with openings in said side walls, comprising an inwardly extending tongue on each of said brackets receivable in and movable into and out of said openings in different planes at opposite side walls of said support, and manually adjustable locking means accessible through at least one of said openings, adapted to adjustably engage said tongues and effective to lock said brackets against movement relative to said support.

3,854,689

LOAD-BEARING HOOK

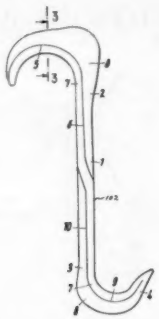
Hans Michael Engels, 15, Lerchenweg, Hofheim, Germany (6238)

Filed July 24, 1972, Ser. No. 274,359

Claims priority, application Germany, Aug. 3, 1971, 7129741[U]; Dec. 2, 1971, 2159730

Int. Cl. A22c *15/00*

U.S. Cl. 248—340 **6 Claims**



1. A unitary load-bearing hook having an S-shape configuration which lies in a single plane when viewed from the side, said hook comprising:

an arcuate top part including a lower flange portion having a lower surface, said lower surface corresponding to a segment of the outer surface of a cylinder and further including an upper longitudinal stiffening rib positioned perpendicularly to said flange portion, the said lower surface of said flange portion being the load-bearing surface of said top part;

an arcuate bottom part being substantially pointed at one end thereof and including an upper flange portion having an upper surface, said upper surface corresponding to a segment of the surface of a cylinder, and further including a lower longitudinal stiffening rib positioned perpendicularly to said flange portion, said upper surface being the load-bearing surface of said lower part;

a connecting portion between the top part and the bottom part comprising a flange portion and a longitudinal stiffening rib portion said flange portion of said connecting portion passing across said connecting portion whereby the flange on said upper portion of the connecting portion adjacent to the arcuate top part lies on one side of the hook and comprises a continuation of the downward facing surface of said top part while the remaining portion of said flange on the lower portion of the connecting portion adjacent to the bottom arcuate part lies on the other side of the hook and comprises a continuation of the upward facing surface of said bottom part; and

the thickness of the stiffening rib measured perpendicularly to the load-bearing surface of the top part increases from the free end of the top part to a maximum value substantially at a point just before the radius of curvature of said top part increases at its point of juncture with said connecting portion, thereafter the total thickness of the rib along said connecting portion decreases to a constant value relative to the thickness of the flange along the major section of said connecting portion increasing again to its maximum value at the lower sector of the hook substantially at a point just after the radius of curvature of said bottom part decreases to its substantially constant value decreasing again to reach its minimum at the free, pointed end of the bottom arcuate part,

wherein said hook is constructed of heavy duty load-bearing plastic which is resistant to corrosion when in contact with meat.

3,854,690

MEANS FOR FORMING CIRCULAR ROOFS

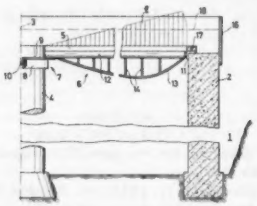
Otto Heinzle, Sonderberg 19, A-6840 Götzis, Austria

Filed Dec. 26, 1972, Ser. No. 318,273

Claims priority, application Austria, Dec. 24, 1971, 11120/71

Int. Cl. E04g *11/04*

U.S. Cl. 249—19 **5 Claims**



1. An arrangement for pouring a concrete ceiling comprising:

a. an upright supporting column having an axis;

b. an upright wall extending about said column in radially spaced relationship, said wall circumferentially bounding a cavity about said column;

c. a collar having a plurality of parts;

d. fastening means releasably tightening said parts about the topmost portion of said column in a position in which said collar projects radially from said column;

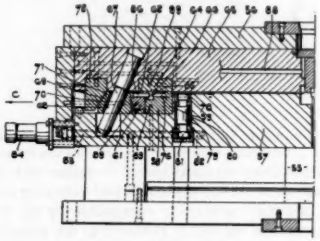
e. a plurality of horizontally elongated carriers, each carrier having an inner longitudinally terminal portion supported on said collar and an outer longitudinally terminal portion supported on the top surface of said wall;
f. panel means supported on said carriers, said panel means substantially closing said cavity in an upward direction and constituting the bottom of a form;
g. annular sheeting means upwardly projecting from said wall beyond said panel means for horizontally containing concrete poured in said form; and
h. recess-forming means superimposed on each of said outer terminal portions for forming a recess in said poured concrete.

3,854,691

APPARATUS FOR MOULDING PLASTIC ARTICLES

Victor William Stanley Humphrey, Radlett, England, assignor to GKN Sankey Ltd., Bilston, Staffordshire and ARO Plastics Development Limited, London, both of, England

Division of Ser. No. 139,376, May 3, 1971, Pat. No. 3,787,549. This application Sept. 10, 1973, Ser. No. 395,582
Int. Cl. B29c *6/02*
U.S. Cl. 249—91 **3 Claims**



1. Apparatus for making an aperture-defining frame member comprising a rigid frame-shaped reinforcement embedded in synthetic resinous material, the apparatus comprising mould parts which define a mould cavity having the shape of the required frame member, the mould parts including a fixed inner member, outer members movable towards and away from the inner member in first directions parallel to a fixed plane and a closing member movable towards and away from inner and outer members in second directions perpendicular to said plane, a plurality of pin like projections for locating the reinforcement in the cavity, means for mounting respective pairs of said projections on said inner and outer members around said cavity to prevent movement of the reinforcement in the cavity at least in directions parallel to said plane and so that the longitudinal axis of each projection is parallel to said plane and to one of said first directions; and positively operable means for projecting into and withdrawing from the mould cavity those respective projections mounted on the inner member.

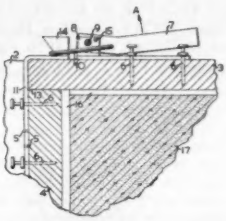
3,854,692

CORNER LOCKS FOR CONCRETE FORMS

George A. Milton, 5412-103A Ave., and Ian M. Russell, 5411-103A Ave., both of Edmonton, Alberta, Canada

Filed June 23, 1972, Ser. No. 265,525
Claims priority, application Canada, July 20, 1971, 118649
Int. Cl. E04g *9/00*
U.S. Cl. 249—194 **4 Claims**

1. A corner assembly of a concrete form comprising:
a substantially upright sheeting defining inner walls of said corner assembly;
first and second whalers being substantially horizontal and supporting said sheeting to form an outer corner assembly;
an end face of said first whaler abutting against the side of said second whaler adjacent at the end of said second whaler;
a corner lock for releasably holding said first and said second whalers in an assembled position to support said sheeting;
said corner lock comprising a lever base and a catch base, each of said bases being secured to one of said whalers; said lever base being provided with a lever assembly including a lever pivotally connected to a bracket means and carrying a hook link;



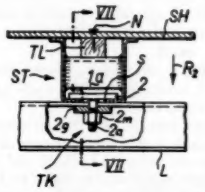
the catch base carrying a catch adapted to be engaged with said hook link;
one of said bases being substantially straight and secured to said second whaler, the other base being bent to form two arms to angularly fit said corner, one of said arms being secured to said first whaler, the other of said arms being in engagement with an outer face of said second whaler, whereby the clamping force created by the locking of said lock is substantially parallel to said outer face of said second whaler.

3,854,693

SUPPORT SYSTEM FOR CONCRETE FORMS

Laurenz Kistler, Chamerstrasse 117, Zug, Switzerland

Filed Aug. 12, 1971, Ser. No. 171,216
Claims priority, application Switzerland, Aug. 17, 1970, 12356/70; Apr. 15, 1971, 5502/71
Int. Cl. E04g *17/00*
U.S. Cl. 249—210 **20 Claims**



1. In combination a support system for concrete forms and concrete forms having form sheathing, comprising form support means, at least one girder provided for said form support means, each said form support means comprising two similar and parallelly extending substantially Z-shaped profile elements arranged in spaced relationship from one another, said pair of Z-shaped profile elements providing profile web means and a pair of confronting flanges and a pair of oppositely directed flanges, traverse means applied to said profile web means for maintaining said Z-shaped profile elements spaced from one another and arranged in such a fashion with respect to the form sheathing that their oppositely directed flanges come to lie at the load side of the form support means at the side of the form sheathing and their confronting flanges at the side of the girder leave free between themselves a slot which is continuous and extends over the entire length of the form

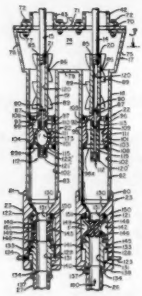
support means, support clamp means for fixedly clamping the girder with the form support means, said support clamp means being introduced from the front of the associated form support means into such essentially perpendicular thereto and through the slot thereof, at least one support extension, and coupling clamp means for fixedly clamping the support extension introduced into a form support means with such form support means, said coupling clamp means being introduced from the rear of said form support means into such and through the slot thereof.

3,854,694

APPARATUS FOR AN AGGREGATE PUMP

Malcolm G. Coone, 10521 Greenwillow, Houston, Tex. 77035

Division of Ser. No. 77,068, Oct. 1, 1970, Pat. No. 3,749,521.
This application Feb. 2, 1973, Ser. No. 329,106
Int. Cl. F16j *15/48*
U.S. Cl. 251—5 **20 Claims**



1. An expandable unit comprising:
a. a hollow inner cylindrical expandable sheath;
b. spaced holding members for supporting said inner sheath therebetween;
c. an outer cylindrical expandable sheath positioned concentrically relative to said inner sheath
d. spaced collar members for supporting said outer sheath therebetween;
e. a plurality of longitudinally positioned strips positioned between said sheaths, said strips including:
1. a plurality of spaced longitudinal outer strips, each having arms and a body, said arms extending toward said inner sheath;
2. a plurality of alternately spaced longitudinal inner strips, each having arms and a body, said arms extending toward said outer sheath;
3. each of said arms of each of said outer strips overlapping with each of said adjacent arms of said inner strips contacting one adjacent body of said inner strips; and
f. fluid means positioned between said inner and outer sheaths to provide continuous lubrication for said strips wherein pressure on said inner expandable sheath or fluid means causes said strips to expand radially outwardly until said arms of said inner strip interlock with said arms of said outer strip when said member is in its maximum expanded position.

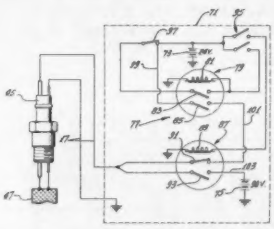
3,854,695

ELECTROMAGNET CONTROL APPARATUS

Benton F. Baugh, Houston, Tex., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Sept. 28, 1972, Ser. No. 293,007
Int. Cl. H01h *47/04;* **F16k** *31/06*
U.S. Cl. 251—129 **7 Claims**

1. In apparatus for effecting operation of a fluid actuated device: valve means operatively connectable to a source of fluid pressure and to the device, said valve means including a valve member shiftable between a first position preventing flow of fluid from the source to the device and a second position permitting flow of fluid from the source to the device; an electrically actuated means operatively connected to said valve member for shifting said valve member from one of said positions to the other of said positions; means for supplying electric power of a first particular value to said electrically actuated means to effect shifting of said valve member from said one position to said other position; and means for supplying electric power to said electrically actuated means of a second particular value substantially less than said first value to retain said valve means in said other position; said electric power of a first value comprising a first source providing a relatively high potential; said electric power of a second value comprising a second source providing a relatively lower potential than said high potential; switching means for selectively connecting said first source of high potential to said electri-



cally actuated means to shift said valve member to said other position or for connecting said second source of lower potential to said electrically actuated means to retain said valve member in said other position; wherein said switching means comprises a first relay selectively energizable by the lower potential to introduce the higher potential to the electrically actuated means, a second relay connected to the first relay and energizable to introduce the lower potential to the electrically actuated means, a first normally open switch connected to the source of lower potential and operable to simultaneously energize the first and second relays so that the lower potential is introduced to the second relay and the high potential is introduced to the electrically actuated means, and means for continuing current flow from the lower potential through the second and first relays to the electrically actuated means after the first switch is opened to reduce the power consumed and maintain the valve member in said other position.

3,854,696

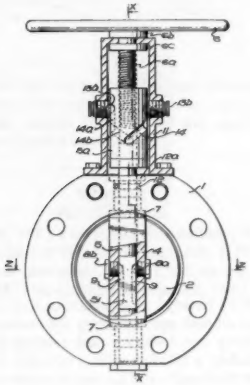
FLUID FLOW VALVE

John Harold Crawford Keyes, Corbridge, and George William Napier, Newcastle upon Tyne, both of England, assignors to Jas. Young & Cunningham (Newcastle) Limited, Killingworth Township, Newcastle upon Tyne, England

Filed Dec. 14, 1972, Ser. No. 315,005
Claims priority, application Great Britain, Dec. 14, 1971, 58085/71
Int. Cl. F16k *5/20*
U.S. Cl. 251—163 **1 Claim**

1. In a butterfly valve device in which the butterfly valve disk is movable transversely of an axis of rotation of the valve disk prior to rotation of the valve disk when opening the valve device by the turning of a handle-shaft means comprising a valve-shaft to which the valve disk is operatively rotatably attached for rotation therewith, including a flow conduit housing for the valve disk with the flow conduit housing providing a valve seat for the valve disk and providing a stem port with the valve shaft extending axially therethrough and rotatable therein and sealed therein against leakage, and including the valve shaft being movable initially axially and then rotatably

during the turning of a handle to open the valve disk to a valve -open position, and with the valve-shaft being operatively connected at one end thereof to the valve disk such that initial axial movement of the valve-shaft causes the valve disk to move laterally away from its valve seat of the flow conduit housing and causes the valve disk after the lateral movement to move with the valve-shaft rotatably in valve disk opening action; the improvement in combination with the valve disk, the handle-shaft means and valve-shaft thereof, and the flow conduit housing with its valve seat and with its stem port, comprising: the valve disk having opposite substantially flat faces extending in substantially parallel planes, the shaft extending in a direction substantially parallel to the planes of said valve disk's opposite flat faces, there being a cylindrically shaped sleeve structure having the valve-shaft fixedly secured



thereto and extending axially from a lower end of the sleeve structure and having an axially extending bore within an upper end of the sleeve structure with the bore being threaded with female threads; a collar housing structure defining a handle-shaft port at an upper end thereof, a base-valve port through which the valve-shaft is extendable upwardly before its connection with a lower end of the sleeve structure, the handle-shaft port and the base-valve port being axially aligned with the stem port, and a side port aligned radially to a cylindrical side of the cylindrically shaped sleeve structure, the collar housing structure being fixedly mounted to said flow conduit housing in surrounding relation to said cylindrical sleeve structure; bearing means mounted within said side port having a ball-bearing structure extending radially inwardly within the collar housing structure, said bearing means being removably mounted in said side port; said cylindrically shaped sleeve structure defining in its cylindrically shaped outer wall two serially consecutive first and second grooves, a first groove being an upper groove extending axially downwardly a first predetermined distance, and continuous with the lower end of the first groove the second groove extending helically downwardly, the width and size of the respective first and second grooves being of predetermined dimensions for accommodatingly receiving slidably along the grooves the ball-bearing structure such that upon the sleeve structure being moved axially upwardly, the sleeve structure moves non-rotatably upwardly as the ball-bearing structure slidably rides along the first groove from an upper to a lower end thereof, and such that upon the structure being moved further upwardly, the ball-bearing structure rides in the helical second groove, whereby during the initial upward movement of the sleeve structure the valve-shaft moves axially upwardly, to withdraw the valve disk from the valve seat and whereby during subsequent helical upward movement of the sleeve structure, the valve-shaft rotates the valve disk to a valve-open position; and the handle-shaft means further including a helically threaded male handle-shaft mounted within said handle-shaft port for rotation therein and mounted against axial movement within said handle-shaft port, a lower end of the helically-threaded male handle shaft being meshably engaged within the female-threaded axial bore of the sleeve structure; and including handle-structure fixedly mounted on the upper end of said male handle shaft; and including parallel flanges extending parallel to each other and spaced from one another a predetermined spacing-distance, formed on and extending perpendicularly outwardly from one of said parallel faces of the valve disk, said flanges each defining therein bearing means directed toward and spaced from the bearing means of the opposite parallel flange, with the bearing means of the respective parallel flanges being substantially axially aligned with one another; and the valve-shaft having the end having the valve disk attached thereto on each of opposite sides of a rectangular formed section thereof third and fourth grooves serially continuous, the third grooves being upwardly located and inclined downwardly, the third and fourth grooves of each of the opposite rectangular surfaces respectively being of predetermined guide dimensions receivable and slidable therein of the respective opposite flange bearing means, such that during initial axial upward movement of the shaft, and valve disk is moved away from the valve seat, and the fourth grooves being continuous with a lower end of the third grooves, the fourth grooves extending axially downwardly such that rotary movement of the valve-shaft rotates therewith the valve disk, the parallel flanges and the valve-shaft oppositely located sides of the rectangular section defining the third and fourth grooves being tightly fitted with one another such that the bearing means of the respective parallel flanges are closed from environmental fluid flowing through the conduit housing, and additionally enclosing connecting structure extending between the opposing parallel flanges on said valve disk such that the valve-shaft is substantially circumscribed in juxtaposition to the third and fourth grooves.

3,854,697

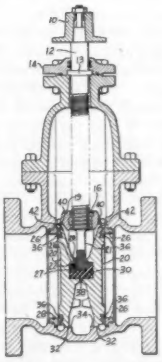
DOUBLE DISC GATE VALVE

Fred W. Salloga, and Charles R. Burger, both of Chattanooga, Tenn., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Filed Jan. 31, 1974, Ser. No. 438,376

Int. Cl. F16k *3/10*

U.S. Cl. 251—167 **8 Claims**



1. A gate valve including, a body portion with body seats, a bonnet portion attached to said body portion, a threaded valve stem rotatably secured to said bonnet portion for raising and lowering said gates to preset stops, and a yoke having a central annular ring with female threads cooperatively en-

gaged with the threads of said threaded valve stem and spaced fingers depending from said ring, wherein the improvement comprises;

two gates each removably and individually suspended from said yoke;

each gate having a rear surface and an outer face;

said rear surfaces of said gates being spaced in close proximity to each other and having aligned mating cavities therein;

a solid flowable material enclosed between said gates and partially filling said cavities;

ram means formed onto the lower extremities of said yokes and filling the remainder of said cavities for compressing said solid flowable material when said gates are lowered onto said preset stops, whereby said gates are forced apart into fluid-tight engagement with said body seats.

3,854,698

DEVICE WITH ADJUSTABLE TURN-SHIFTING BLADES FOR LAYING OR RECOVERING SUBMARINE CABLES

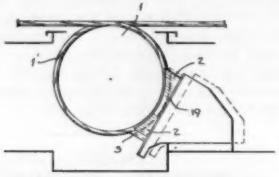
Antonio Ferrentino, Monza, Italy, assignor to Industrie Pirelli Societa per Azioni, Milan, Italy

Filed Nov. 8, 1972, Ser. No. 304,652

Claims priority, application France, Oct. 24, 1972, 72.37625; Italy, Nov. 10, 1971, 30896/71; Finland, Oct. 29, 1972, 02698/72

Int. Cl. B66d *1/36, 3/12;* **B65h** *51/00*

U.S. Cl. 254—190 R **5 Claims**



1. In a device for laying or recovering cable comprising a driven or braked drum revolvable about a predetermined axis and having a peripheral surface on which one or more turns of cable are wound, the combination therewith of mounting means adjacent said peripheral surface of said drum, said mounting means being adjustable toward and away from said peripheral surface, at least one turn-shifting blade, adjustable means mounting said blade on said mounting means adjacent said peripheral surface and with a surface of said blade facing in the direction of said axis and engageable with a portion of a cable on said peripheral surface for shifting said portion in the direction of said axis of said drum, said blade having opposite ends and a length therebetween which is less than the peripheral dimension of said peripheral surface, said blade being disposed with said ends spaced from each other in a direction circumferentially of said axis and said surface of said blade being substantially continuous between said ends and being inclined with respect to a plane orthogonal to said axis, said adjustable means comprising supporting means on said mounting means pivotally supporting said blade and movable with respect to said mounting means in the direction of said axis whereby the inclination of said surface of said blade with respect to said plane may be varied by moving said supporting means in the direction of said axis, said supporting means comprising a pair of means, one engaging a first portion of said blade and the other engaging a second portion of said blade spaced from said first portion thereof in the direction of the spacing of said ends of said blade, both of said pair of means being movable with respect to said mounting means in the direction of said axis, and a pair of thrust elements on said mounting means, one said element acting between said mounting means and one of said pair of means and the other said element acting between said mounting means and the other of said pair of means, each of said thrust elements comprising a fluid actuatable cylinder and piston means and said pair of means being a pair of slides slidable on said mounting means in the direction of said axis whereby said slides and hence said blade may be moved in the direction of said axis by actuation of said cylinder and piston means.

3,854,699

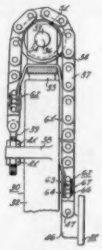
MEANS FOR PROTECTING THE ROD OF A HYDRAULIC LIFT JACK FROM DAMAGE BY THE LIFT CHAIN

Donald P. Garnett, Homewood, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 11, 1974, Ser. No. 450,010

Int. Cl. B60p *1/14, 1/22;* **B66f** *3/24*

U.S. Cl. 254—4 C **5 Claims**



1. In a lift truck having a mast structure, a carriage reciprocably mounted on said mast structure for vertical movement, means for raising and lowering said carriage on said mast structure including a lift jack with a cylinder structure supported on said truck and a rod having an upper end extending from the top of said cylinder structure, a roller carried on said upper end of said rod for rotation about a horizontal axis and a chain trained over said roller and having one end secured to one of said structures and its other end secured to said carriage, the improvement comprising:

a flexible protective band passing beneath said roller and between the latter and said upper end of said rod and having its opposite ends secured to said chain, said band being disposed between said chain and said lift jack at diametrically opposite sides of the latter and operable to prevent said chain from slapping said rod when the latter is extended from said cylinder structure.

3,854,700

MACHINE FOR PRODUCING AERATED FOOD PRODUCTS

John MacManus, 143-16-22nd Rd., Whitestone, N.Y. 11357

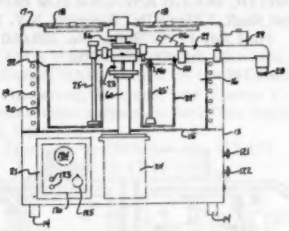
Filed Sept. 6, 1973, Ser. No. 394,779

Int. Cl. B01f *15/02*

U.S. Cl. 259—4 **20 Claims**

1. A machine for producing whipped cream and other stiff flowable aerated emulsion food products, the machine comprising a motor-driven, rotary vane pump having an inlet and an outlet, an air intake operatively connected to the pump inlet, an unpressurized liquid product container, a suction tube leading from the container and operatively connected to the pump inlet, whereby in use the whippable liquid food product and air are simultaneously drawn into the pump, apparatus connected to the pump outlet and defining a flow path along which the mixture of liquid product and air is pumped to a product discharge outlet, and the flow path including a static homogenizer for emulsifying the mixture; characterized in that the pump has a housing defining a pump chamber; a rotor in the pump chamber; a head overlying one end of the pump chamber and having a flat face at said one end through which the inlet and outlet communicate axially

with the pump chamber; a plurality of bolts extending through the head into the housing to removably mount the head on the housing; and a combination seal and wear pad substantially



co-extensive with the flat face of the head and engaged with the body and rotor; the combination seal and wear pad having openings for the passage of the bolts, and openings mating with the inlet and outlet in the head.

3,854,701

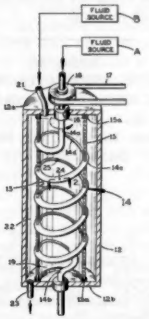
FLUID MIXER

James R. Palma, 1502 Curry Rd., Schenectady, N.Y. 12306

Continuation-in-part of Ser. No. 375,623, July 2, 1973, which is a continuation-in-part of Ser. No. 312,041, Dec. 4, 1972, Pat. No. 3,768,658. This application Sept. 20, 1973, Ser. No. 398,967

Int. Cl. B01f *7/24*

U.S. Cl. 259—8 **11 Claims**



1. In a fluid mixer having an outer housing, and a convoluted conduit inside said outer housing, the improvement which comprises:

an annular wall inside said housing which extends between and joins the successive convolutions of said conduit and provides therewith a first chamber at the inside of said convolutions, and together with said housing and said convolutions provides a second chamber at the outside of said convolutions;

said conduit having openings at the inside of its convolutions which communicate directly with said first chamber and having openings at the outside of its convolutions which communicate directly with said second chamber;

means for introducing first and second fluids under pressure into said conduit to mix with each other inside said conduit;

and means for withdrawing the mixed fluids from the interior of the conduit.

3,854,702

METHOD AND DEVICE FOR THE CONTINUOUS PRODUCTION OF SYNTHETIC RESIN MASSES

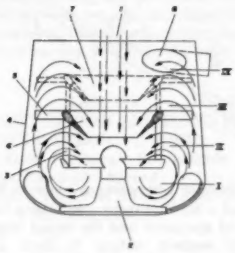
Gunther Papenmeier, deceased, late of Schulstrasse, Pivitsheide vl Kr. Detmold, Germany, (Luise Papenmeier, nee Mellies, widow)

Filed Apr. 28, 1969, Ser. No. 819,709

Claims priority, application Germany, Apr. 29, 1968, 1778436The portion of the term of this patent subsequent to June 17, 1989, has been disclaimed.

Int. Cl. B01f *3/08, 7/20*

U.S. Cl. 259—8 **6 Claims**



1. A method of continuously mixing and preparing synthetic resins comprising the steps of:

centrally feeding into a mixing container at least one synthetic resin and at least one adjuvant into a first zone of said container;

heating said synthetic resin and said adjuvant by intensive frictional and shearing forces produced by a mixing tool rotating on the bottom of said mixing container in said first zone;

displacing at an increased temperature the mixed and heated lighter synthetic particles upwardly in and on the smooth walls of the container;

feeding said heated particles to a second zone in the container immediately above said first zone;

admixing said heated particles with the continuously centrally fed cold heavier particles;

further heating said heated particles in admixture in said first zone;

feeding said further heated particles to a third zone in said container, said third zone being immediately above said second zone;

admixing said further heated particles with said heated particles of said second zone and said continuously centrally fed cold heavier particles;

additionally heating said further heated particles in admixture in said first zone;

feeding said additionally heated particles to a fourth zone in said container, said fourth zone being immediately above said third zone;

admixing said additionally heated particles with said further heated particles of said third zone, said heated particles of said second zone and said continuously centrally fed cold heavier synthetic particles;

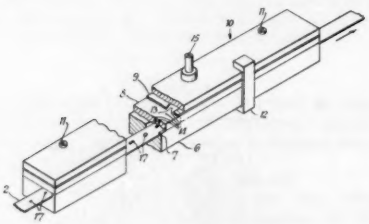
still further heating said additionally heated particles in admixture in said first zone;

and conducting said still further heated synthetic particles away from the upper portion of said mixing container at a given temperature.

3,854,703
METHOD OF AND APPARATUS FOR PROMOTING A REACTION BETWEEN A LIQUID SPECIMEN AND A LIQUID REAGENT

Dudley Francis Gibbs, Bracknell; Edward John Bennet, Wokingham, and William Ian Hopkinson, Camberley, all of England, assignors to Vickers Limited, London, England

Filed Sept. 15, 1972, Ser. No. 289,344
Claims priority, application Great Britain, Sept. 17, 1971, 43575/71; Mar. 30, 1972, 15218/72
Int. Cl. B01f *13/02*
U.S. Cl. 259—11 10 Claims



1. A method of promoting a reaction between a liquid specimen and a liquid reagent, comprising the steps of applying the liquid specimen and the liquid reagent to a liquid-impermeable support surface to form a liquid mixture thereon, causing a jet of gaseous fluid to emerge from a supply duct outlet and impinge upon the liquid mixture on the support surface, and bringing about relative movement between the support surface and said supply duct outlet thereby to cause agitation of the liquid mixture.

3,854,704
MAGNETIC CELL STIRRER

John Thomas Balas, Vineland, N.J., assignor to Wheaton Industries, Millville, N.J.

Filed July 13, 1973, Ser. No. 379,081
Int. Cl. B01f *7/16*
U.S. Cl. 259—118 5 Claims

1. For use with a container for stirring cells and the like, said container including a bottom, a wall upstanding from said bottom, and an opening at the top, a magnetic flexible stirrer comprising:

a. a closure for said opening formed with a central vertical passage and proportioned for a tight fitting relationship with said opening;

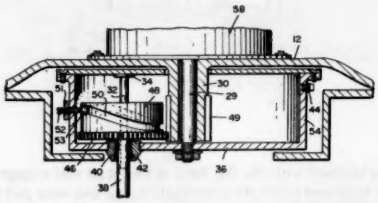
b. a flexible shaft (rotatably) mounted in said central passage with said closure between the ends thereof; and

c. a coated magnet rigidly mounted on said flexible shaft at the lower end thereof and closely adjacent to the bottom of said container when the stirrer is assembled therewith, whereby as said magnet is rotated by magnetic operating mechanism the shaft flexes into an arcuate configuration and moves upwardly and outwardly relative to said bottom by the centrifugal force generated by such rotation causing the said flexure.

3,854,705
AUTOMATIC DOUGH KNEADER FOR HOME USE

Jeanne Mull Shaff, 2 Maple Dr., Roosevelt, N.Y. 11575

Filed July 17, 1973, Ser. No. 380,060
Int. Cl. A21c *1/00*
U.S. Cl. 259—185 8 Claims

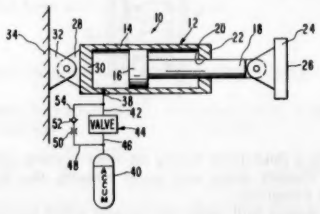


1. A dough kneading machine for home use comprising, in combination, a container for dough to be kneaded, said container having a closed bottom, an open top and wall portions, a lid for said container, means for securing said lid to said open top portion, a sleeve bearing extending downwardly from said lid centrally of said lid, a drive shaft rotatable in said sleeve bearing, a motor mounted on said lid for driving said drive shaft, a closed drum housing having a wall, top and bottom secured to said drive shaft, a kneader arm mounted in said drum housing eccentrically of said drive shaft, said kneader arm extending into said container, and cam means in said drum housing for simultaneously operating said kneading arm in a cirular and vertically reciprocating paths during the rotation of said drum housing.

3,854,706
SHOCK ABSORBING APPARATUS FOR HEAVY LOADS

James G. Johnston, Willits, Calif., assignor to Stanray Corporation, Chicago, Ill.

Filed Mar. 16, 1973, Ser. No. 341,812
Int. Cl. F16f *5/60*
U.S. Cl. 267—116 12 Claims



1. Energy absorbing apparatus comprising: a fluid buffer having a first, fixed, hollow part adapted to contain a hydraulic fluid and a second part mounted on the fixed part for movement relative thereto, said second part adapted to be engaged by a moving mass and to be shifted thereby relative to said first part in one direction to exert a force on the fluid therein; a fluid accumulator exterior of the buffer; means forming a first fluid flow path between said first part and said accumulator; means in said first path for defining a resistance to the increase of pressure in said first path after the pressure therein due to the force exerted by said second part on said fluid has reached a predetermined value; and means in bypassing relationship to said defining means for presenting a second

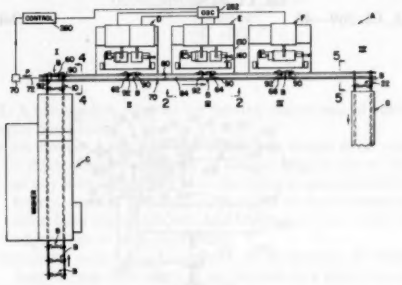
fluid flow path to allow fluid directed to the accumulator along said first path to return to said first part, to thereby urge the second part in the opposite direction when the effect of the movement of said moving mass has been removed therefrom.

3,854,707

APPARATUS FOR INDUCTIVELY HEATING AND QUENCH HARDENING SURFACES ON A CRANKSHAFT

Robert G. Armstrong, Chardon, and George C. Nebesar, Parma, both of Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Nov. 2, 1973, Ser. No. 412,277
Int. Cl. C21d 1/66
U.S. Cl. 266—4 E **6 Claims**



2. An apparatus for inductively heating and quench hardening bearing surfaces on a crankshaft having a central axis, said apparatus comprising: a shuttle extending along a given longitudinal path and having longitudinally spaced crankshaft receiving nest means for supporting a crankshaft with said central axis extending along said path; means for moving said shuttle to locate one of said nest means at a selected position; a carriage pivotally mounted at said position about a carriage axis generally parallel to and offset laterally from said longitudinal path, said carriage comprising means for supporting a crankshaft for rotation about its central axis on a work axis generally parallel to said path and means for rotating said crankshaft in said supporting means about said work axis; means for selectively pivoting said carriage about said carriage axis between a first angular position with said work axis of said carriage generally coinciding with said path, a second angular position, and a third angular position below said second position; means on said carriage for selectively gripping a crankshaft in said one nest means by said support means when said carriage is in said first angular position; means for inductively heating at least one of said bearing surfaces when said carriage moves a crankshaft into said second angular position; and, means for quench hardening at least said one surface when said carriage moves a heated crankshaft into said third angular position.

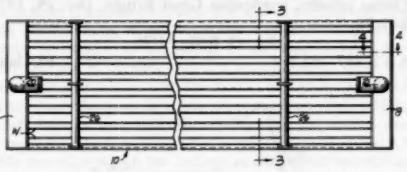
3,854,708

FLUID-COOLED PANEL FOR FURNACE HOOD

Grant H. Highberger, Lyndhurst, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 160,718, July 8, 1971, abandoned. This application July 11, 1973, Ser. No. 378,095
Int. Cl. C21c 5/40
U.S. Cl. 266—16 **4 Claims**

1. A fluid-cooled metal hood panel for a basic oxygen furnace, said panel comprising two spaced headers, a plurality of parallel tubular fluid conduits extending between and connected at opposite ends to and in fluid communication with said headers, nonconduit-forming panel portions between and connecting adjacent fluid conduits, narrower than the conduits and offset to one side of a plane passing midway through and lengthwise of said conduits, said fluid conduits and nonconduit-forming panel portions being formed of a corrugated sheet member having alternate ridges and valleys on each side



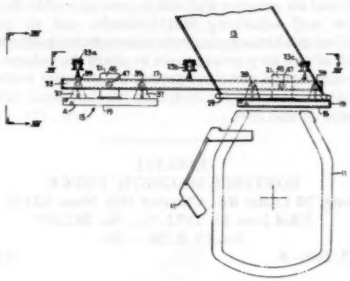
and flat conduit-forming means spanning said valleys on one side only of said sheet member and comprised of a plurality of strips each welded between two adjacent ridges of said corrugated sheet member, and means for supplying fluid to one of said headers and exhausting fluid from the other.

3,854,709

CONTAINMENT OF DUST AND FUMES FROM A METALLURGICAL VESSEL

Richard Gerard Gaw, Pittsburgh, Pa., assignor to Mary F. Gaw, Pittsburgh, Pa., a part interest

Filed July 13, 1973, Ser. No. 379,163
Int. Cl. C21c 5/40
U.S. Cl. 266—16 **21 Claims**



1. A device comprising:

a. a rotatable metallurgical furnace having a furnace mouth disposed at its top; said furnace being disposed in an upright position for oxygen blowing operations and being adapted to rotate about an axis to the left and to the right of said upright position for operations other than oxygen blowing operations;

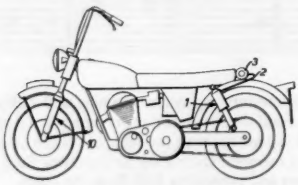
b. an exhaust hood positioned above said furnace for the capture of gas effluent; said hood having a hood mouth that is aligned with said furnace mouth when said furnace is disposed in said upright position; and

c. means for use at said hood mouth that is capable of variably and partially restricting selected portions of the cross-sectional area of said hood mouth to provide a reduced, unrestricted portion and a restricted portion at said hood mouth; said means being cooperatively associated with the rotation of said furnace from its upright position so that said reduced unrestricted portion is disposed to the left of said restricted portion when said furnace is rotated to the left of said upright position and said reduced unrestricted portion is disposed to the right of said restricted portion when said furnace is rotated to the right of said upright position whereby the face velocity of gas effluents entering said hood through said reduced unrestricted portion is increased to improve the capacity of said hood to capture gas effluents.

3,854,710
MOTOR-CYCLE SUSPENSIONS

Lawrence George Nicholls, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Dec. 16, 1971, Ser. No. 208,794
Claims priority, application Great Britain, Dec. 29, 1970, 61667/70
Int. Cl. B60g 11/26
U.S. Cl. 267—64 R 10 Claims

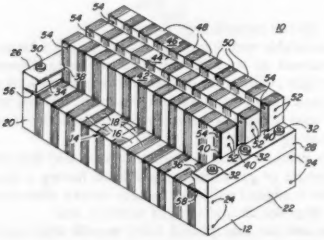


1. A motorcycle suspension system including an hydraulic ram connected between a wheel part and a body part of a motorcycle, said ram including a cylinder connected to one of the parts for movement therewith and a fluid pressure responsive piston including a rod connected to the other part for movement therewith, means for adjusting the pressure acting on said piston comprising means defining an air pressure space and a hydraulic pressure space, said hydraulic pressure space directly communicating with the piston of said ram, a first selectively moveable fluid tight member constituting an end wall of said air pressure space, a second moveable fluid tight partition wall separating said hydraulic and air pressure spaces, and position-varying means for selectively moving said end wall of said air pressure space to adjust the volume of said air pressure space and consequently the pressure within both said spaces to control the hydraulic pressure force acting on the piston of said ram.

3,854,711
PORTABLE MAGNETIC CHUCK

Poy Dong, 70 Louise Rd., Chestnut Hill, Mass. 02135

Filed June 13, 1972, Ser. No. 262,299
Int. Cl. B25b 11/00
U.S. Cl. 269—8 3 Claims

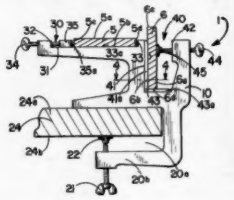


1. A magnetic work holder system including a work holder base adapted to hold a plurality of position blocks for positioning one or more work pieces and having a laminated work surface formed of alternately arranged magnetic and non-magnetic strips, comprising first and second clamp members disposed at opposite sides of said work surface, each of said position blocks having a recess at each end, each of said clamp members having a salient portion on its inner edge for engaging said recess in one or more position blocks disposed between them on said work surface, each of said clamp members including means for tightening a said clamp member toward said work holder base and means, cooperating with a said clamp member, for rotating said salient portion inwardly and downwardly to secure said position blocks, said magnetic strips on said work surface extending farther down that said non-magnetic strips and providing a plurality of spaces between the extended said magnetic strips; and means for providing a magnetic field including an array of magnet members spaced apart by the thickness of a non-magnetic strip, said array being nestable in the underside of the work surface with its magnet members between the magnetic strips and proximate the underside of said non-magnetic strips.

3,854,712
SKI VISE

Weldon L. McGee, 2512 S. Highway 100, Apt. 433, St. Louis Park, Minn. 55416

Filed Dec. 3, 1973, Ser. No. 421,261
Int. Cl. B25b 1/02, 1/20
U.S. Cl. 269—43 3 Claims



1. A ski vise, securable to bench tops and the like, for simultaneously holding two vertically and horizontally oriented skis, said skis generally having relatively flat top and bottom surfaces and opposed lateral edges, said vise comprising:

a. A vise body;

b. Support securing means for removably attaching said vise body to the edge of a bench top and the like;

c. Vertical jaw means carried by said vise body for holding a first ski with the ski top surface in a generally vertical orientation and the ski edges generally horizontal, said vertical jaw means including:

i. Said vise body containing a vertical channel having opposed first and second sidewalls and a bottom surface;

ii. A screw-advance vise jaw carried by said first sidewall and advanceable towards said second wall, said jaw selectively positionable to bear against the ski for holding it in a vertical orientation; and

iii. Said channel bottom surface spanning the entire width of said channel and positioned therebetween to support one ski edge in abutting engagement therewith and the opposite ski edge exposed above said sidewalls;

d. Horizontal jaw means carried by said vise body for holding a second ski simultaneously with and adjacent to the first ski and with the ski top surface in a generally horizontal orientation, said horizontal jaw means including:

i. Said vise body containing a horizontal channel having opposed first and second sidewalls and a bottom surface;

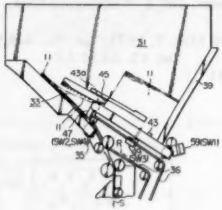
ii. A screw advance vise jaw carried by said first wall and advanceable toward said second wall, said jaw selectively positionable to bear against the edges of the second ski for holding it in a horizontal orientation; and

iii. Said channel bottom surface spanning the entire width of said channel and positioned therebetween to support one abutting ski surface with the opposite surface exposed above said channel sidewalls.

3,854,713
DOCUMENT FEED MECHANISM

Yasuhiko Kohda, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki-shi, Japan

Filed July 7, 1972, Ser. No. 269,608
Claims priority, application Japan, July 7, 1971, 46-49586
Int. Cl. B65h *3/02, 7/14*
U.S. Cl. 271—3.1 **5 Claims**



1. A mechanism adapted for feeding documents of various lengths comprising:

a file-hopper having an upwardly open mouth from which a stack of said documents of various lengths can be piled at any time and a stop plate inclining to one side thereof from a vertical direction so that said stack of documents piled from the mouth into said file-hopper have their rear edges aligned with each other;

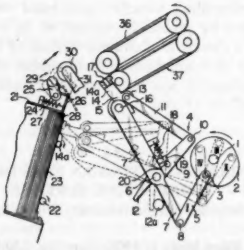
means for conveying a substack of documents of various lengths from said stack of documents in a direction substantially the reverse of the direction in which said documents are to be fed while keeping the rear edges of the conveyed substack of documents aligned, and;

feeding means for momentarily storing said substack of documents of various lengths fed by said feeding means in such a form that the rear edges thereof are aligned and for feeding out one document a time from said momentarily stored documents with said aligned rear edges becoming the front edges of said fed out documents.

3,854,714
SHEET DISPENSING MACHINE

Yoshihiro Hatanaka; Masahiro Abe; Hiroshi Terada, and Shigejiro Inoue, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji-shi, Japan

Filed Dec. 28, 1971, Ser. No. 213,005
Claims priority, application Japan, Dec. 28, 1970, 45-120343; Dec. 28, 1970, 45-120344; Dec. 28, 1970, 45-132798
Int. Cl. B65h *5/08*
U.S. Cl. 271—12 **7 Claims**

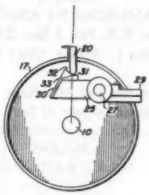


1. A sheet dispensing machine in which sheets held in a stack are successively sucked and continuously fed to a sheet-dispensing section, comprising a container for holding therein the sheets in a stack, conveyor means to convey the sheet placed thereon toward the sheet dispensing section, said conveyor means having an input; and a suction head adapted to be subjected to head-shaking movement for successively sucking and separating the foremost sheet from said stack and to conveying movement for drawing out the sucked sheet from said container while sucking said sheet by said suction head and then for carrying said drawn sheet to the input of said conveyor means; driving means for causing said head-shaking movement of said suction head and said conveying movement; and sheet-holding means including a sheet-holding member which, in relation to the motion of said suction head, moves into and out of contact with the next foremost sheet within said container to step with the motion of said suction head so as to retain this next foremost sheet in place while said foremost sheet is separated from the stack, the driving means comprising a linkage connected to the suction head and rotatable means to which the linkage is connected eccentrically, said linkage and rotatable means causing tilting of the suction head upon contact with the foremost one of the sheets within said container, thereby partly separating said foremost sheet from the rest of the sheets, said linkage including a first link coupled at one end to said rotatable means, a second link swingably mounted at an intermediate point of its length and extending between the other end of said first link and said suction head, a third link swingably coupled to a mid-part of said second link and having an extended end, a stop positioned to restrict the angle of swing of said third link by engagement by said extended end, a spring member biasing said second and said third link toward each other, and a fourth link extending between the other end of said third link and said suction head.

3,854,715
CAM

John F. Coleman, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 19, 1973, Ser. No. 342,640
Int. Cl. B65h *5/14*
U.S. Cl. 271—277 **2 Claims**



1. In facsimile apparatus, the combination comprising

a rotatable drum for conveying sheet material,

a gripper bar extending through the surface of said drum and rotating with said drum, said gripper bar being biased toward the center of said drum for engaging an edge of said sheet material in fixed relationship to said drum surface, and

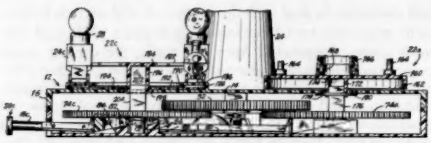
means for simultaneously moving said gripper bar radially outward from said drum and rotating said drum to a predetermined angular position including a cam movable from a first to a second position, said cam having a notched surface for engagement with said gripper bar as said cam is moved from said first position to said second position, said first position being closer to the center of said drum and farther from the surface of said drum than said second position.

3,854,716

MOVING FIGURE TOY ROUNDABOUT

Norman Spiegel, New York, N.Y., assignors to Nasta Industries Inc.

Filed Apr. 19, 1973, Ser. No. 352,603
Int. Cl. A63h 13/20
U.S. Cl. 272—31 R 13 Claims



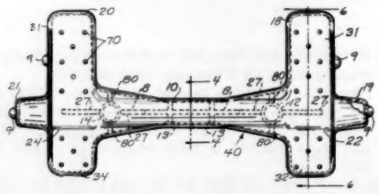
1. Moving figure toy comprising, in combination, a generally enclosed base portion having an upper surface longitudinally extensive in each of a plurality of directions; a plurality of rotatably movable structures carried by said base portion at differing spaced apart locations on said base portion's upper surface; motor means contained within said base portion; a driving pinion gear means carried within said base portion in a first plane spaced apart and generally parallel said upper surface driven by said motor means; a plurality of driven pinion gear means carried within said base portion each positioned relative a respective one of said movable structures and operatively connected for imparting movement thereto, each of said driven pinion gear means being normally disposed in a plane generally beneath the plane of said driving pinion gear menas so that said driving pinion gear means may rotate without meshing therewith; and means for selectively elevating each of said driven pinion gear means for meshing with said driving pinion means.

3,854,717

AMBULATORY AMUSEMENT AND EXERCISE DEVICE

Herbert T. Judkins, R.R. No. 3 Box 235-A-16, Soddy, Tenn. 37379, and Lucian C. Miller, 1903 Leonhard St., Dayton, Ohio 45404

Continuation of Ser. No. 181,309, Sept. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 878,388, Nov. 20, 1969, abandoned. This application May 25, 1973, Ser. No. 363,848
Int. Cl. A63b 23/04
U.S. Cl. 272—70 1 Claim



1. An exercise device of a unitary construction for balance development and amusement, comprising:

a. A straight substantially semicircular rod;

b. A right leg and a left leg molded on the concave surface of the semicircular rod near the two ends of the straight substantially semicircular rod; and

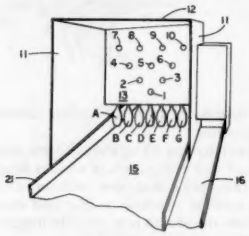
c. A right shoe holder and a left shoe holder each of which has a heel section and a sole section, with the upper surface of each sole section being coplanar with the convex surface of said semicircular rod near the ends of said rod, and the upper surface of each heel section being lower than the upper surface of each corresponding sole section.

3,854,718

APPARATUS FOR IMPROVING BOWLING SKILL

Richard H. Brosier, 266 S. Washington Blvd., Hamilton, Ohio 45013

Filed Mar. 7, 1974, Ser. No. 448,938
Int. Cl. A63d 5/04
U.S. Cl. 273—41 5 Claims



1. A practice apparatus for perfecting bowling technique, said apparatus comprising means providing an elongated alley area down which a conventional bowling ball may be delivered and terminating at a row of seven bowling pins, the longitudinal axes of which all lie generally in a single vertical plane transverse to and at one end of said alley area, said pins being suspended over but out of engagement with said alley area, an array of ten visual indicators arranged above said pins and mounted on a vertical display board, said indicators being adapted to be electrically illuminated upon actuation of controlling switches and said indicators being numbered and positioned in the conventional triangular ten-pin fashion, a switch-actuating probe mounted to the rear of each of said pins for pivotal movement on a horizontal axis parallel to the plane of said row of pins when struck by a bowling ball delivered down the alley, two additional switch-actuating probes extending respectively into the space between the central pin in said row and the pin on its right and into the space between the central pin and the pin on its left, said additional probes being mounted for pivotal movement on a horizontal axis inclined to the plane of said row of pins, electrical means including controlling switches associated with said probes each actuated by pivotal movement of its respective probe completing a circuit to illuminate certain of but less than all of said visual indicators, movement of either of said additional probes to actuate its associated switch completing a circuit to illuminate all ten of said visual indicators.

3,854,719

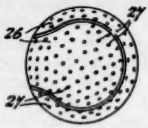
TENNIS BALL HAVING AN ELECTRICALLY CONDUCTING SURFACE

Lyle David Supran, 54, Brondesbury Villas, London, N.W. 6, England

Filed Mar. 1, 1972, Ser. No. 230,897
Claims priority, application Great Britain, Mar. 3, 1971, 5865/71
Int. Cl. A63b 61/00
U.S. Cl. 273—61 R 1 Claim

1. A tennis ball comprising: flexible material in the form of a hollow sphere; a surface consisting of two panels of cloth

stuck to the flexible material so as to cover the entire outer surface of the material of the hollow sphere; and staple sliver

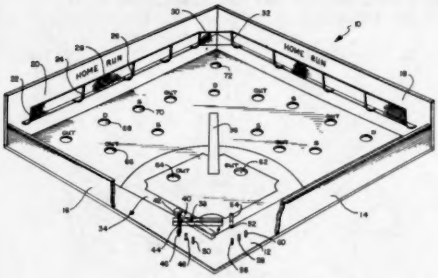


steel uniformly woven into the cloth to form an electrically conducting surface to the tennis ball.

3,854,720
BASEBALL GAME HAVING VARIABLE BATTING MEANS

Calvin David Duvall, 147 Dockser Dr., Crownsville, Md. 21032

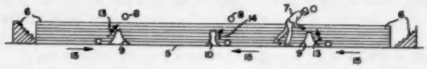
Filed Mar. 28, 1973, Ser. No. 345,709
Int. Cl. A63f *7/06*
U.S. Cl. 273—89 **3 Claims**



1. A baseball game, said game having a diamond shaped base member having four sides, two infield walls secured adjacent each other along two respective sides of said base member, two outfield walls having a height greater than said infield walls secured to the remaining two sides of said base member, a simulated series of bases including a home plate on base member, a pair of apertures juxtapositioned in said base member adjacent to and on opposite sides of home plate, a pivot means adapted to fit in either aperture mounted in one of said apertures, a bat means pivotally mounted on said pivot means for hitting a ball propelled thereto a plurality of peg means located on said base member behind each said aperture, tension means adapted to be selectively connected to any one of said peg means and one end of said bat means whereby the force with which the bat pivots after being released to engage a ball can be varied, the other end of said bat means having a variable means thereon for hitting a ball propelled thereto, a series of shallow aperture means on said base member, each having indicia thereon representing results of a hit and a pitching area on said base member from which one player propels a ball toward home plate.

3,854,721
RECTANGULAR FIELD WITH TRANSVERSE BALL HURDLE

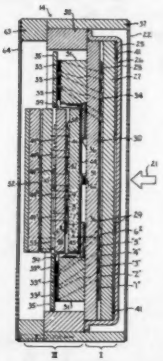
Robert Ellis, 350 Lomas Santa Fe Dr., Solana Beach, Calif. 92075

Filed Aug. 31, 1973, Ser. No. 393,501
Int. Cl. A63b *71/02*
U.S. Cl. 273—95 H **2 Claims**

1. A foot-ball game comprising: a large, rectangular playing field, at least one goal at each of the transverse ends of the playing field, at least one hurdle extending transversely across the width of the playing field, said hurdle comprising a rigid sheet of material having a rounded top with outwardly flared and open space between the top and the field surface such that a ball impelled onto the hurdle will be deflected upwardly and over said hurdle, and at least one resilient ball, so constructed to enable it to roll over the surface of the field.

3,854,722
ELECTRICAL INDICATING TARGET WITH REMOVABLE CENTER SECTION

Johan Alex Ingvar Ohlund, Huskvarna; John Mannerblad, and Gunnar Alexius Wallgard, both of Jonkoping, all of Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden

Filed Dec. 18, 1972, Ser. No. 316,033
Claims priority, application Sweden, Dec. 23, 1971, 16554/71
Int. Cl. F41j *5/04*
U.S. Cl. 273—102.2 A **5 Claims**



1. A target at which electrically conductive projectiles are to be shot from a location in front of the target and which has

defined scoring zones comprising a central zone within which shots are most desirably placed and a plurality of outer zones which lie at different distances outwardly from said central zone and each of which surrounds it, said target being of the type comprising a plurality of pairs of cooperating sheet-like electrically conductive elements that are penetrable by said projectiles, there being at least one of said pairs of elements for each scoring zone and the two elements of each pair being flatwise spaced apart by a distance such that a projectile can be in electrically connecting contact with both simultaneously during its penetration of them, said target also comprising means for electrically connecting each of said pairs of elements with a scoring device that indicates the particular pair of said elements that a projectile has penetrated, said target being characterized by:

A. a frame large enough to embrace all of said zones;

B. first flat, thin carrier means substantially permanently fixed to the frame near the front thereof and carrying pairs of said elements for an outer portion of one of said outer scoring zones and for the whole of all of the outer scoring zones farther out from the central zone than said one outer scoring zone;

C. second flat, thin carrier means having thereon pairs of said elements for the inner portion of said one outer scoring zone and for the whole of all scoring zones inwardly of said one outer scoring zone;

D. readily releasable fastening means detachably supporting said second carrier means in the frame behind the first carrier means and edgewise in a position in which its said pairs of elements are substantially in register with their respective scoring zones;

E. there being partial but substantial edgewise overlap between said elements for the outer portion of said one outer scoring zone and said elements for the inner portion thereof; and

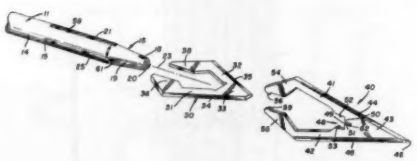
F. corresponding ones of said overlapping elements on the two carrier means being electrically interconnected so that accurate scoring is obtained of shots placed in the scoring zone for said overlapping elements and in the scoring zones adjacent thereto, notwithstanding any edgewise misregister of the carrier means relative to one another.

3,854,723

HUNTING ARROW

Richard I. Wilson, Kalamazoo, Mich., assignor to Shakespeare Company, Kalamazoo, Mich.

Filed July 6, 1970, Ser. No. 52,463
Int. Cl. F41b *5/02*
U.S. Cl. 273—106.5 R **7 Claims**



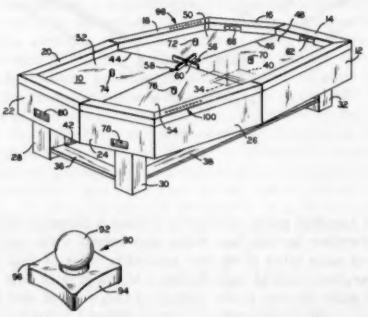
1. A hunting arrow comprising, a shaft having a rearward end, a nose portion and an outer surface, a nock means secured to the rearward end of said shaft, fletchings secured to said shaft forwardly of the nock means, first and second diametric slots opening in a plane axially through the nose portion of said shaft, diametric grooves in the outer surface of said shaft aligned with the plane of said first slot, an anchor means in at least one of said grooves, primary broadhead blade means having a generally triangular web portion terminating in an apex defining the point of said blade means, opposed legs diverging rearwardly from said web portion, a stabilizing edge means on said web portion medially of said legs, a locating foot on each leg spaced rearwardly of said web portion, locking means carried on said locating feet, said stabilizing edge means removably receivable within said first slot and said locating feet removably receivable in said grooves, said locking means interengaged with said anchor means releasably to maintain said primary blade means on said shaft, said second slot having a greater axial extent than said first slot, a second set of diametric grooves in the outer surface of said shaft aligned with the plane of said second slot, a secondary broadhead blade means having opposed legs joined at the forward portion thereof by a stabilizing bridge, a locating foot on each leg of said secondary blade means spaced rearwardly of said stabilizing bridge, said stabilizing bridge removably receivable in said second slot and the locating feet on said secondary blade means removably receivable in the grooves aligned with the plane of said second slot, the stabilizing edge on the web portion of said primary blade means cooperating with the stabilizing bridge means on said secondary blade means to maintain said secondary blade means on said shaft when said primary blade means is secured thereto.

3,854,724

GAME BOARD AND ASSOCIATED APPARATUS

Paul P. Abraham, P.O. Box 597, Athens, Ohio 45701

Filed July 18, 1973, Ser. No. 380,352
Int. Cl. A63d *13/00*
U.S. Cl. 273—125 R **9 Claims**



1. An amusement device comprising: a game board having a multiplanar upper surface;

a playing piece capable of being propelled on the upper surface of said game board;

a striking means capable of propelling said playing piece wherein said striking means includes a striking body slidable on said multiplanar upper surface and having an upstanding generally centrally disposed handle, and at least one concave surface on its periphery adapted for striking said playing piece;

at least a pair of spaced apart playing receiving means;

at least a pair of upwardly extending projections positioned upon the upper surface of said game board between said receiving means;

means extending upwardly from said game board for containing said playing piece and defining a playing surface and having a plurality of holes formed therein for indicating the total number of points scored; and rotary means for deflecting said playing piece rotatably attached at the center portion of the playing surface of said game board.

3,854,725

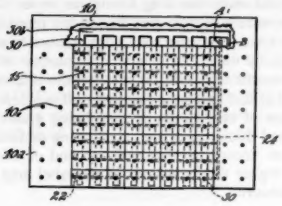
ELECTRIC CHESS GAME BOARDS

Perry U. Cluck, 15928 Finch Ave., Harvey, Ill. 60426

Filed Aug. 6, 1973, Ser. No. 386,221

Int. Cl. A63f *3/02*

U.S. Cl. 273—131 A **7 Claims**



1. A game board with a field of squares, playing pieces deposited on desired squares when played, and means actuated by the deposit of any playing piece to illuminate said piece comprising electric sockets contained in said field squares, rods in the bottom of said game board extending in parallelism under said squares and attached to said sockets along said rods, a bar connecting said rods and an electrical circuit with one terminal connected to said bar.

3,854,726

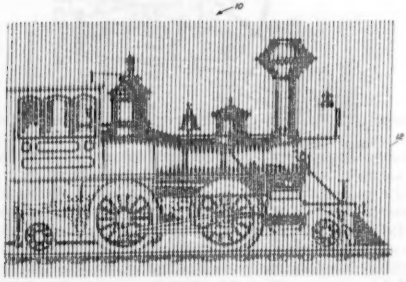
SCREENED PHOTOGRAPH PUZZLE

Alton Parker Balder, 7902 Seven Mile Ln., Baltimore, Md. 21215

Filed Nov. 2, 1973, Ser. No. 412,182

Int. Cl. A63f *9/10*

U.S. Cl. 273—157 R **4 Claims**



1. A puzzle, comprising a plurality of puzzle pieces the combination of which forms an enlarged discernible composite photographic image including screen lines, enlargement of the original photographic image to produce the discernible composite photographic image on the pieces causing of plurality of shades of distorted and varying random-appearing densities to exist on the pieces, the puzzle pieces being defined physically along their edges by the screen lines, each puzzle piece having a substantially identical physical configuration as the other pieces, each puzzle piece having a specific pattern thereon forming a portion of the discernible composite photographic image, the pattern on each piece being defined by the plurality of shades, the shades having varying degrees of quality and being distorted to provide random-appearing densities of the shades on the pieces, the patterns on the pieces and the edges of the pieces defined by the screen lines being combinable in a predetermined alignment by matching the shades on the surfaces of the pieces and along the edges thereof to allow proper location of each piece within the puzzle to reveal the nature of the enlarged composite image.

3,854,727

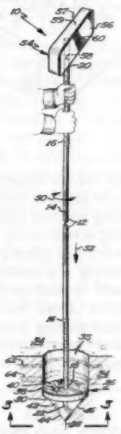
COMBINED SNOW BORING TOOL AND BALL STRIKING CLUB

Ernest H. Alexander, 5136 Woodland Rd., Minnetonka, Minn. 55343

Filed Mar. 7, 1974, Ser. No. 449,190

Int. Cl. A63b *53/00*

U.S. Cl. 273—162 F **5 Claims**



1. A combined snow-boring tool and club for playing a golf-like ball game in snow and adapted to bore a cup in the snow for receiving of the ball, comprising:

an elongated, substantially straight shaft having first and second ends and a central longitudinal axis, first and second spaced apart hand grip members located on said shaft adjacent said first and second ends respectively;

a rigid snow-compressing disk having a central axis and fixed to said shaft adjacent said first end, the axes of said disk and shaft substantially coinciding, the obverse side of said disk forming a flat snow-compessing surface oriented substantially perpendicularly to said shaft and facing away from said second end of said shaft for compressing

snow when said disk and first end of said shaft are forced axially downwardly into the snow to form a cup in the snow;

a rigid drill plate fixed to and extending outwardly from said snow-compressing surface of said disk, said drill plate being oriented perpendicularly to the said snow-compressing surface and positioned diametrically across said snow-compressing surface of said disk to cut through snow in response to rotation of said drill plate, disk and shaft about the axes of said shaft and disk; and

a weighted club head rigidly fixed to said second end of said shaft to increase the momentum of said shaft, disk and drill plate when said shaft is forced vertically downwardly by an operator to urge said drill plate and disk into the snow to pierce and compress the snow to define a circular cross-section ball cup in the snow, said club head including at least one ball-striking surface to permit driving of the ball with the club head when said club head and said shaft are swung through an arc.

3,854,728

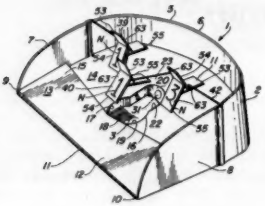
GOLF PUTTING GAME DEVICE

John R. Brandell, 1527 Sequoia Ave., Glenview, Ill. 60025

Filed Aug. 13, 1973, Ser. No. 388,125

Int. Cl. A63b *69/36*

U.S. Cl. 273—179 A **21 Claims**



1. A golf putting game device comprising

a. means affording a target area into which a ball may be putted from a putting position remote from that area,

b. means for returning a ball along a predetermined path from said area toward said putting position,

c. spinner means, having a plurality of at-rest positions, mounted in said path in position to be struck by such a ball during movement of said ball along said path from said area toward said putting position to thereby cause said spinner means to rotate out of the at-rest position in which it was disposed.

3,854,729

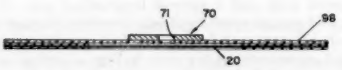
RECORD DIVIDER AND PRESERVATIVE

Thomas P. Downs, 1927 Mathews AVe., Apt. A, Redondo Beach, Calif. 90278

Filed June 1, 1973, Ser. No. 365,965

Int. Cl. G11b *3/62*

U.S. Cl. 274—1 R **4 Claims**



1. An annular protective disc for use with 45 r.p.m. records for insertion between said records prior to stacking the records on the spindle of a record player, while said disc is substantially the same in circumference as a 45 r.p.m. record, said disc having a radially innermost portion and a radially outermost portion in concentric relationship therewith, said radially outermost portion coextensive with the sound groove zone of a 45 r.p.m. record, comprising:

a layer of annular sheet stock of magnetic material coextensive with the diameter of said disc, having a centrally disposed aperture adapted to receive the spindle of a record player, said aperture similar to the size of the aperture in a long playing record,

cushioning material secured to the top and bottom of the radially outermost portion, to protect said sound groove zone,

an annular magnetic ring, having an outer circumference slightly less than the circumference of the central aperture of a 45 r.p.m. record, said ring adapted to fit within said central aperture in a close juxtaposition relationship to the circumference of said aperture, wherein the bottom end of said magnetic ring is concentrically mounted with respect to the aperture of the sheet stock, to prevent lateral or longitudinal displacement of the 45 r.p.m. record, said magnetic ring having an inner diameter of approximately ½ inch, and having the requisite strength and thickness to secure a 45 r.p.m. record to said protective disc by means of magnetic attraction when the 45 r.p.m. record is placed on said spindle intermediate the top end of said magnetic ring and said protective disc, the thickness of said magnetic ring being greater than the combined thickness of said cushioning material and said 45 r.p.m. record, so that said top end of said magnetic ring is higher than the level of the label area of said 45 r.p.m. record.

3,854,730

CONTROL MECHANISM FOR PHONOGRAPH RECORD PLAYER

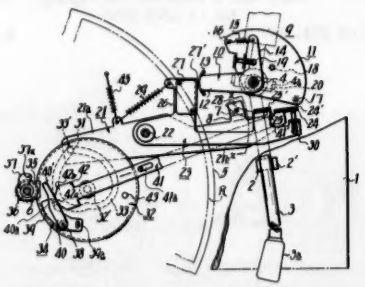
Kazuyuki Takizawa, Inzai-machi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 18, 1973, Ser. No. 425,831

Claims priority, application Japan, Dec. 29, 1972, 48-556

Int. Cl. G11b *17/06*

U.S. Cl. 274—15 R **14 Claims**



1. In a phonograph record player for use with a phonograph record having a spiral groove with sounds recorded therein leading to a final non-recorded groove portion, and which includes a frame, a turntable rotatable on said frame, a motor operative for driving the turntable, a tone arm assembly hav-

ing a tone arm for carrying a pickup with a stylus to track the groove of a record on said turntable, and means mounting said tone arm on said frame for lateral swinging movement across said turntable and for raising and lowering of the tone arm relative to said turntable between an elevated rest position outside the perimeter of said turntable and an inner position corresponding to the engagement of the pickup stylus in said first non-recorded groove portion of a record; a control mechanism comprising switch means having ON and OFF conditions for rendering said motor operative and inoperative, respectively, switch operating means for establishing said OFF condition of the switch means when said tone arm is initially in said rest position and for establishing said ON condition of the switch means in response to at least a predetermined lateral swinging movement of said tone arm from said rest position, detecting means operative in response to the arrival of said tone arm at said inner position thereof, a rotatable control member rotated from an initial position by said turntable in response to operation of said detecting means, a lever connected with said rotatable control member so as to be turned from a starting position to a displaced position and then returned to said starting position in response to a complete revolution of said control member starting from said initial position, cooperatively engageable means on said lever and tone arm assembly for returning said tone arm to said rest position in response to turning of said lever to said displaced position, and means on said lever for preventing the establishment of said OFF condition of the switch means by said switch operating means when said lever is displaced from said starting position thereof.

3,854,731

FLUID TIGHT SEAL AND METHOD OF MAKING SAME

Arthur E. Gealt, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 5, 1973, Ser. No. 329,444
Int. Cl. F16j *15/10*
U.S. Cl. 277—26 **2 Claims**

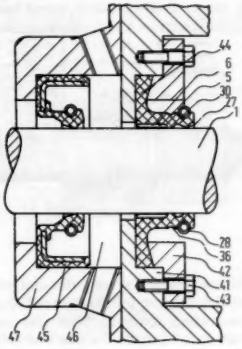
1. A fluid tight sealing means to seal an opening formed between the outer wall of a cylindrical member that has a low coefficient of thermal expansion and an adjacent annular member that surrounds said cylindrical member that has a substantially higher coefficient of thermal expansion while wide degrees of temperature changes occur in the environment surrounding the sealing means, said sealing means being a ring constructed of a resilient plastic material that has an inner fluid tight sealing wall surface and axial sidewall surfaces which together provide a U-shaped configuration, said inner sealing wall being dimensioned to resiliently engage the outer wall of the cylindrical member, and a wrinkled outer wall surface that is dimensioned to resiliently engage the inner surface of said annular member.

3,854,732

SEALING ARRANGEMENT

Dietmar Franz, Lampertheim, and Wilhelm Schmitt, Erbach, both of Germany, assignors to Carl Freudenberg Kommanditgesellschaft, Weinheim, Germany

Filed Jan. 11, 1972, Ser. No. 216,734
Claims priority, application Germany, Jan. 12, 1971, 2101120; Jan. 19, 1971, 2102348
Int. Cl. F16j *15/32*
U.S. Cl. 277—58 **8 Claims**



1. A sealing arrangement comprising, in combination, a first member, and a second member surrounded by said first member, one of said members being rotatable relative to the other and said members being lubricated by a flow of lubricating fluid directed at their interface along said one member axially of the same; at least one annular sealing member received between said first and second members and having radially directed sealing edges respectively engaging the same, said sealing member also having oppositely directed axial ends one of which is subject to higher and the other of which is subject to lower ambient fluid pressure, and a circumferential surface provided with engaging portions of a material having low coefficient of friction and high resistance to wear; and a circumferentially extending contact face provided on said circumferential surface of said sealing member at said other axial end in the region of one of said sealing edges, said contact face being of at least approximately cylindrical outline and being in engagement with said one member via an interposed film of said lubricating fluid.

3,854,733

SHAFT SEAL

Roy E. Wilson, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed July 24, 1972, Ser. No. 274,555
Int. Cl. F16j *9/00*
U.S. Cl. 277—82 **6 Claims**

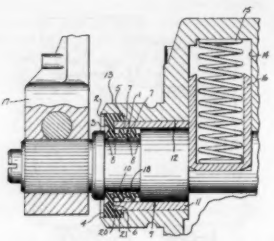
1. In a seal for a shaft that extends through an opening of a member which presents an axially extending rim, a length of said shaft being smaller in diameter than said opening to have

an annular space for receiving a seal, the combination of:

a resilient sleeve that encircles said shaft and is disposed in said annular space so as to be encircled in turn by the wall of said opening;

a plurality of axially spaced annular sealing ribs formed integrally on the interior surface of said sleeve to project radially inward and abut the surface of said shaft;

a plurality of axially spaced annular pressure ridges formed integrally on the exterior surface of said sleeve that are in an offset axial relation to said sealing ribs, and projecting radially outward from said sleeve to abut against the wall of said opening;



said sleeve with said integral sealing ribs and pressure ridges having a radial depth greater than the radial extent of said annular space when removed from said space, so that upon insertion in said space the ribs and ridges fit firmly against said shaft surface and said opening wall respectively with portions of said sleeve between ribs and ridges held in flexed condition; and

an integral head portion for said sleeve having an annular flange projecting radially outward from one end of said sleeve, which flange has a circumferential lip extending back to overhang said sleeve to form a niche in the head portion, said niche receiving said rim of said member with a snug fit to seal said rim with said head portion.

3,854,734

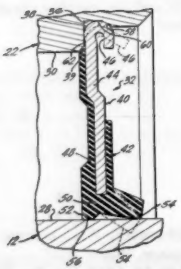
BEARING SEAL ASSEMBLY

James E. West, Ann Arbor, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Continuation of Ser. No. 821,663, May 5, 1969, abandoned. This application Feb. 3, 1971, Ser. No. 112,462

Int. Cl. F16c *1/24*

U.S. Cl. 277—170 **7 Claims**



1. A seal for sealing the space between confronting radially inner and outer cylindrical surfaces of a pair of spaced relatively rotatable members wherein the outer cylindrical surface has an annular groove, comprising an annular reinforcing element including a shallow cup-shaped ring of metal with a long generally radial flange and with a short generally axial outwardly directed flange defining the outer periphery of the seal and which can be folded in press-fitting engagement into the groove of said outer cylindrical surface, an annular sealing element including a body portion secured to the radial flange of said reinforcing element and projecting radially inward therefrom and a marginal portion projecting radially inward from the body portion and defining at its radially inner extremity axially spaced inner and outer lips, the inner lip extending in a radial direction normal to the axis of the annular sealing element and having in its unstressed condition a continuous cylindrical surface normal to said radial direction for seating on the outer circumference of said inner cylindrical surface, said continuous cylindrical surface being located axially inward of said radial flange, the outer lip being inclined away from the inner lip and terminating axially outward of said radial flange and radially beyond said cylindrical surface of the inner lip so that it can be deflected radially and axially outward to a position providing an interference fit with said radially inner cylindrical surface, said marginal portion having a relatively large cross-section with said inner lip being relatively short and thick with a radially inner wall parallel to said radial flange and said outer lip being relatively long and thick.

3,854,735

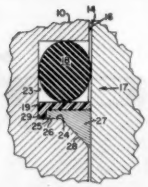
STATIC FACE SEAL

William C. Maurer, and Everett H. Lock, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 24, 1972, Ser. No. 300,074

Int. Cl. F16j *15/06*

U.S. Cl. 277—189 **14 Claims**

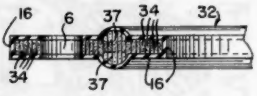


1. A static face seal assembly for sealing the junction of a pair of radially extending surfaces, one of said surfaces having a groove formed therein, said groove being defined in part by an outer axially extending wall having a beveled edge, said static face seal assembly comprising a seal ring disposed in said groove for sealing the clearance gap between said pair of radially extending surfaces; a soft-metal anti-extrusion ring having a first portion which defines an axially extending surface sized to fit in close conformity with said axially extending wall of said groove, and a second portion which defines an outwardly sloping shoulder adapted to engage said beveled edge in said one of said surfaces and the other of said surfaces to prevent extrusion of said seal ring.

3,854,736
DENSIFIED CONVOLUTE GASKET STRUCTURE

Robert G. Farnam, New Lisbon, Wis., assignor to F. D. Farnam Co., Lyons, Ill.

Filed Oct. 27, 1972, Ser. No. 301,435
Int. Cl. F16j *15/06*
U.S. Cl. 277—204 17 Claims

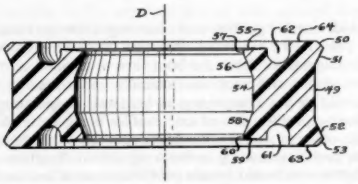


1. A substantially flat gasket structure for sealing mating parts together in which the gasket structure is interposed between the mating parts and clamping means are provided for drawing the mating parts into sealing engagement with the gasket structure, the improvement wherein said gasket structure has a flat body portion comprising a convolutely wound annular gasket characterized by alternate discrete layer of a carrier material and a fluid impermeable polymeric material adhered thereto with the polymeric material being cured and of substantially uniform thickness from layer to layer, said body portion throughout substantially the entire extent of the gasket structure being compacted to a substantially uniform density, said gasket structure having one or more apertures spaced inwardly from the peripheral edge thereof, and a coating on the top and bottom surfaces of the gasket structure and on the interior walls of said apertures, said coating comprising a unitary and continuous layer of at least partially cured elastomer-resin formed from a thermosetting mixture of synthetic elastomer and synthetic resin with the mixture curing at a temperature in the range of 325° F and 400° F and having a thickness in the range of .0001 inch and .005 inch, said coating being of lower density than the compacted body portion and highly conformable to surface imperfections in the mating parts.

3,854,737
COMBINATION ROTARY AND RECIPROCATING UNITARY SEALING MECHANISM

Howard E. Gilliam, Sr., North Tonawanda, N.Y., assignor to Chemprene, Inc., Alden, N.Y.

Filed Jan. 21, 1974, Ser. No. 435,341
Int. Cl. F16j *15/48*
U.S. Cl. 277—205 18 Claims



1. A sealing mechanism described in relation to a horizontal plane which intersects said mechanism into upper and lower segments; said upper segment comprising an upper surface; a channel, located in said upper surface and projecting towards said plane; a first wall vertically positioned with respect to said plane said connected to said upper surface; a second side wall vertically positioned with respect to said plane and connected to a first lip, which lip is connected to said upper surface and comprises an upper face which is attached to said upper surface, a lower face which is attached to said second side wall, which upper and lower faces converge and are attached to a vertically positioned side face; said lower segment comprising a lower surface; a channel, located in said lower surface and projecting towards said plane; a third side wall vertically positioned with respect to said plane and connected to said lower surface and to said first side wall; a fourth side wall vertically positioned with respect to said plane, connected to said second side wall and to a second lip, which lip is connected to said lower surface and comprises an upper face which is attached to said fourth side wall, a lower face which is connected to said lower surface, which upper and lower faces converge and are attached to a vertically positioned side face.

3,854,738
MONOSKI

Norman B. Fish, 191 Miller Rd., North Windham, Conn. 06256

Filed May 31, 1973, Ser. No. 365,411
Int. Cl. A63c *5/00*
U.S. Cl. 280—11.13 W 11 Claims

1. In a monoski comprising an elongated ski with a lower running surface and a platform assembly with forward and rear platform supports on the ski with upper forward and rear platform sections collectively providing a raised platform above the ski, and upper ski boot binding means for selectively supporting a skier on the raised platform, the improvement wherein the platform assembly comprises platform support mounting means for longitudinally adjusting at least one of the platform supports to adjust the relative spacing of the forward and rear platform supports on the ski between first relatively adjacent positions for supporting a skier with the upper ski boot binding means on the raised platform and second relatively spaced positions for supporting a skier at an alternative lower position below the raised platform and between the forward and rear platform sections, and wherein the monoski comprises lower ski boot binding means for selectively supporting a skier at said alternative lower position between the platform sections.

3,854,739
SKIS WITH STEERING STRINGS

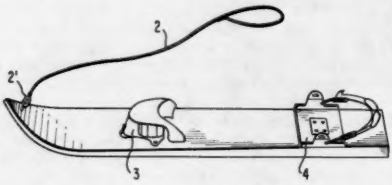
Takashi Toda, Nishinomiya; Katsumi Kimizuka, Nagoya, and Iwao Takahashi, Hyogo, all of Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed July 30, 1973, Ser. No. 383,744
Int. Cl. A63c *5/06*
U.S. Cl. 280—11.13 S 5 Claims

1. A ski adapted to support a single foot, said ski having the following characteristics:

a. an upwardly curved front tip;
b. an uncurved sliding surface;
c. a steering string attached to the curved front tip;
d. a boot heel binding mounted on the ski plate near its tail end so as to place the center of the body weight near the tail end of the ski;

e. overall length which is remarkably shorter than that of conventional skis; and



f. gradually increasing thickness from the front tip to the tail end.

3,854,740

RELEASABLE SKI BINDING PARTIALLY MOUNTED IN A SKI BOOT SOLE

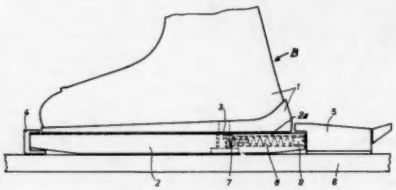
Ernst Gertsch, Wengen, and Ulrich Gertsch, Interlaken, both of Switzerland, assignors to Gertsch AG, Wengen, Switzerland

Filed Nov. 27, 1972, Ser. No. 309,927

Claims priority, application Switzerland, Dec. 6, 1971, 17794/71

Int. Cl. A63c 9/08

U.S. Cl. 280—11.35 R **6 Claims**



1. A releasable binding for skis and partially mounted in the ski boot sole of a ski boot having a ski boot upper and ski boot sole, the improvement comprising said ski boot sole and ski boot upper being connected for rotation with one another, a mechanism for lateral release of the ski boot for retaining the ski boot sole and the ski boot upper against rotation, said lateral release mechanism including a spring-loaded locking mechanism mounted in the ski boot, and a mechanism for the vertical release of the ski boot which is arranged upon the ski, said ski boot upper and said ski boot sole form two parts of the ski boot, said spring-loaded locking mechanism includes pivot means defined by a cam-like member, a cam follower member cooperating with the cam-like member, and said spring biasing said cam follower towards the cam-like member, said cam-like member being carried by one part of said ski boot and said cam follower being carried by another part of said ski boot.

3,854,741

TOE IRON FOR SAFETY SKI BINDINGS

Hannes Marker, Hauptstrasse 51-53, and Roland Jungkind, both of Garmisch-Partenkirchen, Germany, assignors to said Marker, by said Jungkind

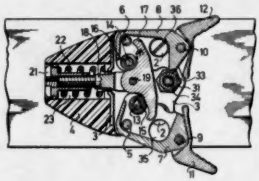
Filed Feb. 6, 1973, Ser. No. 329,991

Claims priority, application Germany, Feb. 25, 1972, 2209055

Int. Cl. A63c 9/08

U.S. Cl. 280—11.35 T **10 Claims**

1. A toe iron for safety ski bindings, the toe iron comprising: a toe iron member adapted to be secured to a ski and having a center line which lies substantially along the longitudinal center line of an associated ski; first and second levers pivotably mounted at one end on respective vertical axes opposite from one another on respective sides of the center line of the toe iron member; first and second soleholders mounted at the respective free ends of said first and second levers; a bearing member on each of said first and second levers nearer to the center line of said toe iron member than said vertical axes; a



yoke adapted to move relative to the associated ski having first and second guideways for bearing against respective ones of said bearing members; a stop adapted to be fixed relative to the associated ski for limiting the movement of said first and second levers to a predetermined normal position; and spring means for biasing said yoke against said bearing members to thereby urge said first and second levers to pivot into engagement with said stop.

3,854,742

GUIDING AND CENTERING DEVICE FOR SKI-BOOT

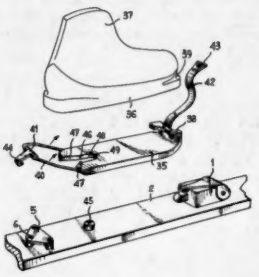
Georges Pierre Joseph Salomon, 34, Avenue de Loverchy, Annecy, France

Filed May 2, 1973, Ser. No. 356,353

Claims priority, application France, May 5, 1972, 72.16103

Int. Cl. A63c 9/00

U.S. Cl. 280—11.35 Y **15 Claims**



1. A device for guiding and centering a boot in relation to a ski, prior to the ski-fitting operation carried out by binding means adapted to fasten the boot firm in position on the ski and to release said boot automatically under predetermined loads, said device comprising: at least two cooperating male and female profiles, one of said profiles being secured to the ski, the other of said profiles being secured to the boot; said female profile extending in the longitudinal direction of the element to which said female profile is secured and including at least one passage defined by two lateral surfaces, said passage running substantially in the longitudinal axis of said element and having at least one end open to receive said male profile, said male and female profiles alllowing a longitudinal sliding displacement of said boot on said ski to thereby provide a correct positioning of the boot in relation to the ski before said boot is fastened firm to said ski by said binding means.

3,854,743

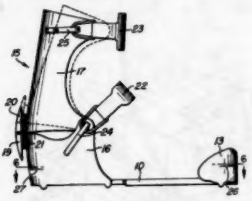
SKI BOOT ATTACHMENT FRAME

Hans Walter Hansen, 78 College Ave., Ephraim, Utah 84627

Filed Aug. 2, 1973, Ser. No. 385,160

Int. Cl. A43b *3/10*

U.S. Cl. 280—11.35 K **5 Claims**



1. A device for attaching a soft boot to ski bindings on a ski and for strait-jacketing such soft boot so it simulates a stiff ski boot for skiing purposes, comprising an elongate, rigid, step in base having a front member for securely retaining the toe of the soft boot, and a substantially separate, articulated rear member constituting a heel upper of unstretchable material, said heel upper opening forwardly and including a lower heel portion and an upper ankle portion, means pivotally connecting the two portions for articulation about a horizontal axis, and means yieldable under stress normally interconnecting said portions so as to resist articulation, said heel upper being adapted to close to embrace the upper of a received soft ski boot; means for securing said rear member in closed, constrictive position about said upper of the received soft ski boot; and means on the base for latching cooperation with a ski binding.

3,854,744

SKI SAFETY BINDING

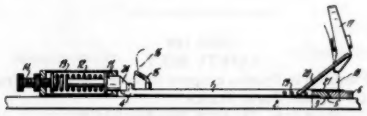
Georges Pierre Joseph Salomon, 34, avenue de Loverchy, Annecy, France

Filed May 31, 1973, Ser. No. 365,639

Claims priority, application Switzerland, June 9, 1972, 8566/72

Int. Cl. A63c *9/00*

U.S. Cl. 280—11.35 K **5 Claims**



1. A ski safety binding for ski boots comprising, a foot-plate for mounting on the upper surface of a ski, spaced front and rear end stops fixed to said ski upper surface and between which said binding is mounted, at least one of said stops including a flexible retaining device, said foot-plate including clamping members for a boot, at least one of said clamping members being adjustable so as to enable the attachment to said ski of a boot of shorter or longer length than the length of said foot-plate, the upper surface of said rear stop disposed substantially flush with the upper surface of said foot-plate to enable one of the ends of a boot longer than the foot-plate to extend beyond it, and a planar extension plate mounted on the rear of said foot-plate and extending the upper surface of the rear end of said foot-plate beyond the rear of said foot-plate and in an overlying manner relative to said rear stop, said extension plate engaging the upper surface of said rear stop and supporting at least a portion of the bottom surface of a heel of a boot to provide a continuous boot supporting member having a substantially planar supporting surface from the toe to the heel of the boot, said extension plate having a low coefficient of friction relative to said rear stop to facilitate separation as an integral unit of said foot-plate extension plate and boot from said ski upon impact of an unusual force.

3,854,745

SKI CONSTRUCTION, PARTICULARLY FOR CHILDREN

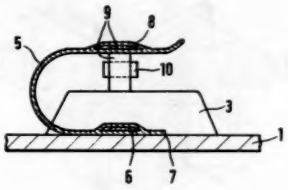
Martin Puchtler, Rangenweg 9, D-8583 Bischofsgrun, Germany

Filed July 30, 1973, Ser. No. 383,473

Claims priority, application Germany, Aug. 2, 1972, 2238047

Int. Cl. A63c *9/04*

U.S. Cl. 280—11.35 A **12 Claims**



1. In a ski, particularly for children, an elongated ski body having a lower running surface and an upper shoe-engaging surface, heel-holding means situated between the ends of said body and being rigid therewith, said heel-holding means extending upwardly from said upper surface of said body and having a front concave surface directed toward a front end of the ski so that said heel-holding means can receive a heel of the shoe, said heel-holding means including a strap for holding the heel releasably in engagement with the heel-holding means, a pair of side wings situated at least in part forwardly of said heel-holding means at opposite sides of the ski body and being rigid therewith and extending upwardly from the upper surface of said ski body at the opposed side edges thereof, said pair of wings respectively being formed at least with a pair of aligned openings extending through said wings and being substantially flush with the upper surface of said ski body, an elongated sheet-material strip having a width substantially equal to the width of the ski body between said wings thereof, said strip of sheet material having one end region situated next to the upper surface of said ski body between said wings thereof and said strip extending first forwardly then upwardly and then rearwardly over the part of said strip which is situated next to said upper surface between said wings, and strap means engaging said strip and extending therefrom through said openings of said wings and to the portion of said strip which extends rearwardly over the portion situated between said wings next to said upper surface of said ski body for forming together with said strip an enclosure for receiving and covering a front end region of a shoe.

3,854,746

COLLAPSIBLE ICE SHELTER AND SLED

Errol W. Flynn, 9845 84th St. S.E., Alto, Mich. 49302, and Gene E. Mutschler, 1063 Dahlia, Wayland, Mich. 49348

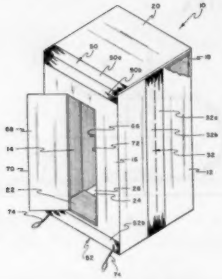
Filed June 1, 1973, Ser. No. 366,185

Int. Cl. B62b *13/16*

U.S. Cl. 280—12 S **12 Claims**

1. A collapsible ice shelter comprising, in combination: first and second pairs of opposed wall panels hingedly connected to each other, said first pair of wall panels having first and second panel portions hingedly connected to each other and to said second pair of wall panels, said first and second panel portions of said first pair of opposed wall panels being foldable between an erected position wherein each of said first and second panel portions lie in the same plane forming said first

pair of opposed wall panels, said first and second pairs of opposed wall panels forming a rectangular enclosure, and a collapsed position wherein said first and second panel portions of said first pair of opposed wall panels are folded relative each other into parallel flush planes intermediate said second pair of opposed wall panels in accordion fashion; a roof and floor panel hingedly connected to one of said second pair of opposed wall panels and foldable relative said one panel between an erected position wherein said roof panel covers the top of said shelter and said floor panel covers at least a portion of the bottom of said shelter when said shelter is upright and said first pair of wall panels are in said erected position, and



a collapsed position wherein said roof and floor panels are in a parallel flush plane with said one panel; one of said wall panels having means defining an access opening into and out of said shelter when erected and a door means hingedly connected to said one panel along one edge of said access opening to close said access opening, the floor of said shanty having means defining a fishing opening therein when erected; and a pair of runners fixed to the outer side of the other of said second pair of opposed wall panels, said other of said second pair of opposed wall panels and runners forming a sled for transporting said shelter when said panels are in collapsed position.

3,854,747

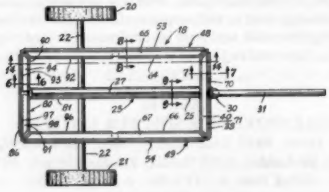
LATERALLY AND LONGITUDINALLY EXTENSIBLE TRUCK

James F. Johnston, P.O. Box, Union, Mo. 63084

Filed Mar. 28, 1974, Ser. No. 455,641

Int. Cl. B62d *21/14*

U.S. Cl. 280—34 B **10 Claims**



10. In the truck of claim **1:** the main frame comprising and elongated spine member, the laterally spaced supporting elements comprising a transverse axle secured to the spine member between its ends, with a wheel at each end; the spine having the second support means at its end and comprising a vertically disposed element engageable with the ground and projecting upwardly, and a handle engageable with the upwardly projecting part of the vertically disposed element.

3,854,748

INDUSTRIAL PALLET AND STILLAGE TRUCKS

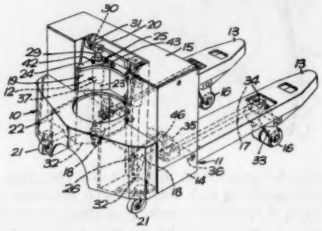
Cecil Goodacre, Basingstoke, England, assignor to Lansing Bagnall Limited, Basingstoke, Hampshire, England

Filed Apr. 3, 1973, Ser. No. 347,366

Claims priority, application Great Britain, Apr. 10, 1972, 16485/72

Int. Cl. B62 *3/02*

U.S. Cl. 280—43.12 **6 Claims**



1. An industrial pallet or stillage truck comprising a body portion, a load carrying portion mounted for up and down movement relatively to the body portion, two hydraulic rams for raising a root portion of the load carrying portion, and a linkage operated by movement of the root portion relatively to the body portion and including ground engaging members for raising and lowering the end of the load carrying portion remote from the root portion, in unison with the root portion, each ram comprising a standing part connected to the body portion and a movable part connected to the load carrying portion, and the linkage comprising two operative levers each pivotally connected at its fulcrum to said root portion and also being pivotally connected directly to the lower end of said standing part of one of the rams, whereby up and down movement of the root portion imparts pivoting movement to the levers to operate said linkage, and means for mounting the standing part of at least one of said rams to said body portion so that it is adjustable longitudinally with respect to said body portion, whereby longitudinal adjustment of the standing part of said one ram moves the lever connected to that standing part and thereby adjusts the position of the associated ground engaging member with respect to the load carrying portion.

3,854,749

SAFETY BELT

Walter Fieni, Paris, France, assignor to Societe Anonyme Francaise Du Ferodo, Paris, France

Filed Mar. 21, 1973, Ser. No. 343,572

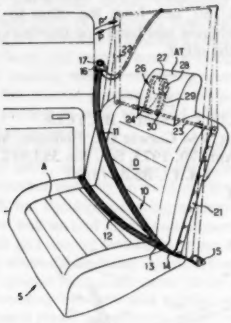
Claims priority, application France, Dec. 4, 1972, 72.43077; Mar. 24, 1972, 72.10528

Int. Cl. B60r *21/10*

U.S. Cl. 280—150 SB **9 Claims**

1. Three point safety belt installation particularly for an occupant of a vehicle having a floor and a seat with a seat back, comprising a seat belt, either end thereof being fixedly anchored to respective one of two vertically spaced structural portions of the vehicle on one side of the seat, a common strap, one end thereof being secured to an intermediate portion of said seat belt and the other end thereof being connected to a belt retractor secured to the floor on the other side of the seat, a transverse shaft rotatably mounted in an upper portion of the seat back, a pair of arms movable from a first position wherein said seat belt engages the occupant of the vehicle to a second position wherein said seat belt is removed from the occupant for easy ingress and egress to and from the seat, each of said arms being non-rotatably connected at one end thereof to a respective end of said shaft and having an aperture provided at the other thereof, each said aperture

slidably engaging respective one of said common strap and said seat belt, actuating means operatively connected to said



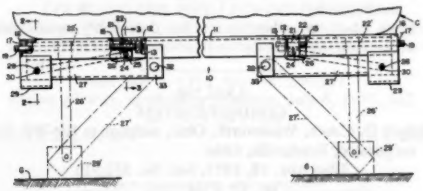
shaft for rotating said arms between said first and second position.

3,854,750

RETRACTABLE SUPPORT FOR MOBILE CAMPERS AND THE LIKE

Carl Voehringer, Jr., 2 Wedger Rd., Spencerport, N.Y. 14559

Filed Jan. 15, 1973, Ser. No. 323,625
Int. Cl. B60s 9/02
U.S. Cl. 280—150.5 **2 Claims**



1. A device for supporting a parked camper, comprising

a beam adapted to be secured beneath a camper to extend transversely between opposite sides thereof,

a pair of spaced operating screws, each of which is journaled at opposite ends, respectively, in a channel in said beam for rotation independently of each other about a common axis extending longitudinally of said beam, and each of which has a wrench-engageable head at its outer end,

a nut threaded on each of said screws for axial movement in said channel when the associated screw is rotated,

a pair of legs mounted on said beam to pivot about fixed parallel axes, extending transversely of said beam, the pivots for the two legs being disposed closer to one another than the inner ends of the two screws,

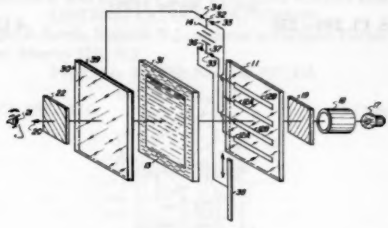
a pair of links, each pivotally connected at one end to one of said nuts and at its opposite end to one of said legs, whereby, upon rotation of a screw in one direction, the associated leg is lowered to supporting position, and, upon rotation of the screw in the opposite direction, the associated leg is retracted.

3,854,751

METHOD FOR RAPIDLY SWITCHING A DISPLAY BY SEQUENTIAL APPLICATION OF ORTHOGONAL ELECTRIC FIELDS TO A LIQUID CRYSTAL MATERIAL HAVING OPTICAL PROPERTIES OF THE NEMATIC MESOPHASE

Werner E. L. Haas, Webster, and James E. Adams, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 9, 1973, Ser. No. 349,497
Int. Cl. G02f 1/28
U.S. Cl. 350—160 LC **21 Claims**



1. An electro-optic method, comprising:

a. providing a layer of liquid crystalline substance having the optical properties of the nematic mesophase optical uniaxial state;

b. applying a first electrical field substantially normal to the optic axis of said substance, wherein the optic axis of said substance is rotated substantially parallel to said first electrical field; and

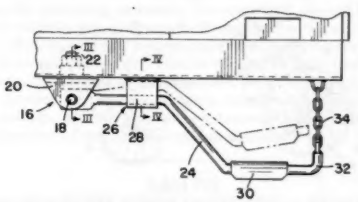
c. removing said first electrical field and then applying a second electrical field substantially normal to the direction of said first electrical field, wherein the optic axis is rotated substantially parallel to said second electrical field.

3,854,752

VEHICLE STEP MOUNTING ARRANGEMENT

Walker H. Flint, Peoria, and Gerald R. Haedicke, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 23, 1973, Ser. No. 390,878
Int. Cl. B60r 3/02
U.S. Cl. 280—166 **9 Claims**



1. In a vehicle having a frame portion which is susceptible to encountering obstacles, step means attached to said framed portion comprising:

a bar member;

pivot means interconnecting one end of the bar member and the frame portion, and allowing the bar member to be pivoted upwardly and downwardly relative to the frame portion;

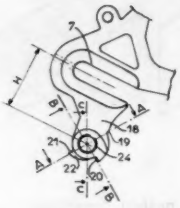
restraining bracket means fixed relative to the frame portion and associated with the bar member for supporting the bar member in a lower position, the bar member

adopting such lower position by pivoting downwardly relative to the frame portion under its own weight, meanwhile allowing pivoting of the bar member upwardly relative to the frame portion upon the bar member encountering an obstacle tending to pivot the bar member upwardly relative to the frame portion.

3,854,753
DEVICE FOR FIXING A GEAR-CHANGER ON A FRAME OF CYCLES

Claude Hautier, Chinois Nantes, France, assignor to Micmo S.A., Machecoul, France

Filed Jan. 8, 1973, Ser. No. 322,023
Int. Cl. B62m *25/00*
U.S. Cl. 280—236 **4 Claims**



1. Bracket means on a cycle frame for supporting any of a plurality of different gear changers for pivotal movement thereon and having stop means for limiting pivoting of the gear changers in one direction;

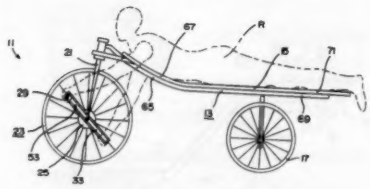
said bracket means having an opening for pivotally supporting said gear changers; and

a plurality of stop shoulders on said bracket, angularly spaced about said opening and each being positioned to cooperate with the stop means on only one of different gear changers.

3,854,754
ARM PROPELLED CYCLE

Raymond C. Jablonski, 1879 Coventry Dr., Memphis, Tenn. 38127

Filed Apr. 26, 1974, Ser. No. 464,513
Int. Cl. B62m *1/14*
U.S. Cl. 280—242 R **6 Claims**

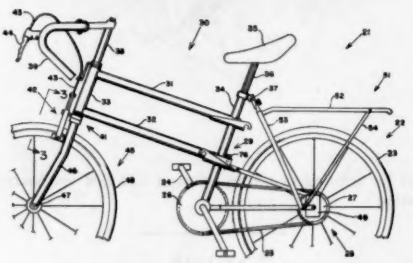


1. An arm propelled cycle for carrying a rider disposed in a prone position thereon, said cycle comprising frame means including an elongated body board for supporting the rider in a prone position, a pair of axially aligned rearward wheels rotatably attached to said frame means, downwardly directed fork means pivotally attached to said frame means for pivotal movement about a substantially vertical axis, forward wheel means having coaster-brake means for rotatably attaching said forward wheel means to the lower end of said fork means; crank means coupled to said coaster-brake means and being operable therewith for selectively propelling said cycle, stopping said cycle, and steering said cycle; said crank means having a pair of hand-grip members rotatably attached thereto for permitting the rider to manipulate said crank means by grasping said hand-grip members, and slide-bar means established in part by said crank means for enabling one of said hand-grip members to be slidably shifted relative to the other from a drive position wherein said hand-grip members are radially displaced 180° one from the other to a coasting-steering position wherein said hand-grip members are radially aligned one with the other.

3,854,755
COLLAPSIBLE BICYCLE

Thomas L. C. Tang, 254 Gorwin Dr., Holliston, Mass. 01496

Filed Apr. 20, 1973, Ser. No. 352,952
Int. Cl. B62k *13/00*
U.S. Cl. 280—278 **22 Claims**



1. A collapsible bicycle comprising:

a rear power module including a rear wheel and pedal means coupled thereto;

an operator control module comprising seat means and steering means;

power module coupling means for detachably coupling said rear power module and said operator control module;

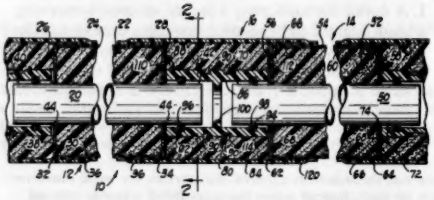
a front wheel module comprising a front wheel and a fork means; and

front wheel coupling means for detachably operatively coupling said fork means to said steering means.

3,854,756
CONDUIT SYSTEM

Robert O. Couch, Wadsworth, Ohio, assignor to Ric-Wil, Incorporated, Brecksville, Ohio

Filed Apr. 19, 1973, Ser. No. 352,511
Int. Cl. F16l *11/12*
U.S. Cl. 285—47 **11 Claims**



1. In a conduit system wherein a plurality of insulated conduit units are laid end to end and adjacent ends of the conduit units are joined and sealed;

a. a first conduit unit comprising a length of pipe, a body of insulating material extending circumferentially about said pipe and axially along said pipe, a sleeve-like jacket extending circumferentially about said body of insulating material, said pipe defining end portions extending a predetermined distance axially from said body of insulating material and sealing means extending circumferen-

tially between the pipe and the jacket for sealing said body of insulating material;

b. a second conduit unit comprising a second length of pipe, a second body of insulating material extending circumferentially about said pipe and axially along said pipe, a second sleeve-like jacket extending circumferentially about said body of insulating material, said second pipe defining end portions extending a predetermined distance axially from said second body of insulating material and second sealing means extending circumferentially between the second pipe and second jacket for sealing a jacket portion at each axial end of said second body of insulating material; and,

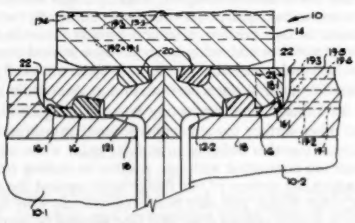
c. a coupling unit interposed between said first and second conduit units, said coupling unit comprising a tubular body member defining an axial opening extending therethrough for slidably receiving adjacent end portions of said first and second pipes, said adjacent end portions of said first and second pipes being spaced apart and unconnected within said tubular member, first and second seals axially spaced from each other along said tubular body and extending between said tubular body and said first and second pipes, respectively, said first and second seals providing a fluid tight seal between said tubular body and said pipes while permitting said adjacent end portions of said pipes to move endwise within said tubular body, a third body of insulating material extending about said tubular body and interlocked with said tubular body whereby said tubular body and said third body of insulating material are fixed against movement relative to each other, and insulation protecting means extending at least circumferentially about said third body of insulating material, at least one of said tubular body and said third body of insulating material having an axial length which is greater than the combined projecting lengths of said adjacent end portions of said first and second pipes whereby said first and second pipes are free to thermally expand and contract axially relative to said coupling unit.

3,854,757

COUPLING FOR PIPE-LIKE COMPONENTS

Ivan Charles McOran-Campbell, Salisbury, Rhodesia, assignor to Turners Asbestos Products (Private) Limited, Salisbury, Rhodesia

Filed July 6, 1972, Ser. No. 269,297
Claims priority, application Rhodesia, July 8, 1971, 262
Int. Cl. F16l *17/00*
U.S. Cl. 285—100 **12 Claims**



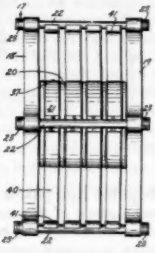
1. A coupling for connecting two hollow members which, in use, are internally pressurized, each member having a coupling spigot of lesser outside diameter than the outside diameter of the adjoining part of the member so that a shoulder is defined between each spigot and the adjoining part; an axially movable annular piston surrounding each spigot; surfaces on said members for limiting the distance through which the pistons can move in the direction away from one another; an annular collar surrounding the pistons; a collar seal sealing between each piston and the collar, the collar seals being located in grooves and the axial length of the collar being greater than the spacing between the collar seals when the pistons are at their maximum separation; and a spigot seal sealing between each piston and its spigot, the collar and pistons and seals defining a chamber which extends around the spigots and which is in communication with the interior of the spigots, the arrangement being such that, in use, the pressure in said chamber tends to force the pistons apart towards their respective shoulders, and both the insides and outsides of the spigots are subjected to the pressure within said members thereby to minimise the risk of the spigots bursting.

3,854,758

FLEXIBLE EXPANSION JOINT HAVING MEANS FOR LIMITING LATERAL MOVEMENT

Douglas R. Lewis, Summit, N.J., assignor to Ethylene Corporation, Murray Hill, N.J.

Filed May 4, 1973, Ser. No. 357,328
Int. Cl. F16l *13/04*
U.S. Cl. 285—114 **3 Claims**



1. In a flexible joint coupling for use in interconnecting a pair of rigid conduits and including first and second flange elements connected to a bellows-type flexible conduit element having means surrounding the same limiting radial expansion thereof under internal pressure, the improvement comprising: said flange elements each having a plurality of outwardly extending ears, each ear having a centrally disposed bore therethrough, a corresponding plurality of axially extending rods, each slidingly interconnecting on each end thereof a bore in an ear on each of said flange elements, and means on said rods preventing disengagement of said flange elements from said rods; said means limiting radial expansion including a plurality of rigid bands surrounding portions of said flexible conduit element, each of said rigid bands having a plurality of outwardly extending members, the outer ends thereof having means slidably engaging medially disposed surfaces of said rods; whereby said first and second flange elements may slide axially on said rods as said flexible conduit element contracts, expands, and adapts to misalignment, and the outer ends of said outwardly extending members on said rigid bands slidingly engage said rods preventing substantial lateral shifting or displacement of the flexible conduit element.

3,854,759

APPARATUS FOR INTERCONNECTING A HYDRANT AND A RISER

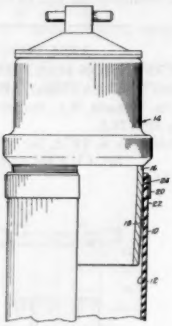
Gail Cornelius, Portland, Oreg., assignor to R. M. Wade & Co., Portland, Oreg.

Filed Mar. 27, 1973, Ser. No. 345,283
Int. Cl. F16l *33/00, 47/00*
U.S. Cl. 285—251 **5 Claims**

1. Apparatus for interconnecting a hydrant with an unthreaded riser pipe fixed in a vertical position for conducting fluids therethrough comprising:

a tubular body portion fixed relative to and communicating with the hydrant and extending inwardly of the riser pipe, and defining an outer threaded surface tapered down-

wardly and inwardly of the riser pipe and in threaded engagement with the inner surface of the riser pipe, the diameter of the inwardly extending end of the body portion being smaller than the inner diameter of the riser pipe and the diameter of the body portion toward the hydrant being greater than the inner diameter of the riser pipe; and



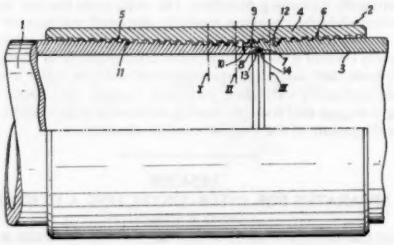
means disposed about the riser pipe in the area of engagement of the inner surface of the riser pipe with the tapered outer surface of the tubular body portion to limit outward movement to a predetermined amount of the riser pipe in relation to the tubular body portion, and to provide substantially sealing relation of the inner surface of the riser pipe and the tapered outer surface of the tubular body portion.

3,854,760

JOINT FOR OIL WELL DRILLING PIPE

Jean Duret, Aulnoye-Aymeries, France, assignor to Societe anonyme dite: Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies), Paris, France

Filed Feb. 22, 1973, Ser. No. 334,944
Claims priority, application France, Feb. 25, 1972, 72.6471
Int. Cl. F16l *25/00*
U.S. Cl. 285—334 **11 Claims**



1. In a joint for connecting metallic pipe sections comprising

a male member provided with a thread formed on a frusto-conical outer surface, and

a female member provided with a mating thread formed on a frusto-conical inner surface of said female member, said female member having a shoulder positioned at the inner end of the threads thereon, which shoulder limits the penetration of said male member into said female member due to the abutment of the end of said male member against said shoulder, and which shoulder is provided with an annular groove defined by a frusto-conical inner surface which inclines inwardly of said female member as it approaches the tip of said shoulder, and an outer surface encircling said inner surface,

said male member having a lateral surface adjacent the inner end thereof which is spaced by a first lateral clearance from the encircling portion of said female member, the improvement according to which:

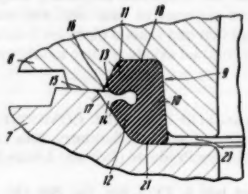
said female member is a composite member comprising a sleeve and a false male member, said sleeve being provided with two female threads positioned on frusto-conical surfaces, each of which is inclined outwardly as it approaches one of the two ends of the sleeve, one of which female threads is the thread mating with said male member and separably receives said male member, while the other female thread permanently grips mating threads on said false male member, said shoulder being formed at the end of said false male member and a second lateral clearance being provided between the shoulder-carrying end of said false male member and the part of said threaded sleeve encircling it.

3,854,761

SEALING ARRANGEMENT

Walfried David, Maxdorf, Germany, assignor to Bopp & Reuther GmbH, Mannheim, Germany

Filed Jan. 8, 1973, Ser. No. 322,093
Claims priority, application Germany, Jan. 11, 1972, 2201131
Int. Cl. F16l *23/00*
U.S. Cl. 285—336 **3 Claims**



1. A sealing arrangement comprising two components each having a flange portion with a surface juxtaposed with a surface of the respective other flange; a first annular recess in one of said surfaces and being bounded by a first annular bottom face and at its radially outer side by an outwardly inclined first annular surface portion; a second annular recess in the other of said surfaces and being bounded by a second annular bottom face and at its radially outer side by an outwardly inclined second annular surface portion, and at its radially inner side by an annular bead projecting beyond the general plane of said other surface toward said first annular bottom face, said recesses together defining an annular space when said components are connected with one another in sealing relationship in which the surface of one flange abuts against the surface of the other flange and said bead extends into said first recess and is slightly spaced from said first annular bottom face and an annular sealing ring of elastomeric material embracing said annular bead under tension, the outer surface of said bead engaging and supporting said sealing ring throughout approximately its entire axial length, said sealing ring being in axial section of substantially strip-shaped configuration and and having two axially spaced radially outwardly directed annular ridges each of which contacts one of said annular surface portions and the annular bottom face associated therewith, means to secure the components together, said sealing ring being compressed in axial direction when said components are connected in said sealing relationship without, however, completely filling said annular space, and said annular ridges being

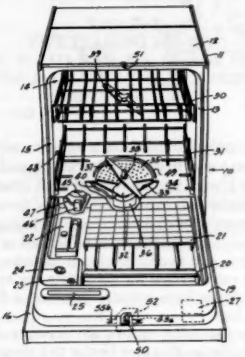
deflected toward one another in said axial direction by their contact with the respective surface portion and bottom faces.

3,854,762

ROTARY HANDLE DOOR LATCH FOR DISHWASHERS

Ray W. Spiegel, Stevensville; Chester W. Wassilak, Benton Harbor, and Adolph D. Corn, Stevensville, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 2, 1973, Ser. No. 385,051
Int. Cl. E05c 3/06
U.S. Cl. 292—197 17 Claims



1. In a dishwasher having means for defining an opening, and a closure for selectively closing said opening, latching means for holding said closure in a position sealing said opening, said latching means comprising:

a strike defining an edge portion of said opening;

a bolt having a surface means for contacting said strike, said bolt mounted on the closure for pivotal movement of said surface means in a first plane to draw the closure into a sealing position in the opening and to release the closure from the sealing position, and said bolt being deflectable for movement of said surface means in a second plane to move the bolt into and out of alignment for engagement with the strike; and

an operating lever interconnected to said bolt and being rotatable through a given arc, said lever pivoting said bolt in said first plane during rotation in one portion of the arc and deflecting said bolt in the second plane during rotation in the remaining portion of the arc so that rotation of the lever in one direction through the arc releases the closure from the sealing position and then disengages the bolt from the strike to allow moving the closure away from the opening and rotation in the opposite direction causes the bolt after alignment with the strike to draw the closure into the sealing position.

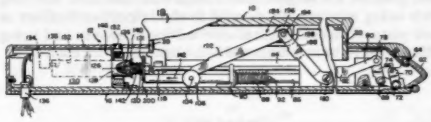
3,854,763

ELECTRICAL AND MECHANICAL DOGGING DEVICE

George Z. Zawadzki, and Maksimiljan Godec, both of Indianapolis, Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Filed July 18, 1973, Ser. No. 380,504
Int. Cl. E05c 3/06
U.S. Cl. 292—201 11 Claims

1. A panic exit latch and actuator assembly comprising a latch bolt movable between a projected position and a retracted position, spring means yieldably urging said bolt to its projected position, an actuator element, means supporting said actuator element for movement between a first position and a second position, first means providing an operative connection between said actuator element and said latch bolt to move said latch bolt to its retracted position in response to movement of said actuator element from its first position to its second position, a panic bar for moving said actuator element from its first position to its second position, a control member movable between a first position and a second position, said control member being operatively connected to said latch bolt to move said latch bolt to its retracted position in response to movement of said control member from its first position to its second position, said first connection means including a lost-motion connection permitting movement of said latch bolt to its retracted position by said control member without moving said actuator element from its first position to its second position, and solenoid means for moving said control member



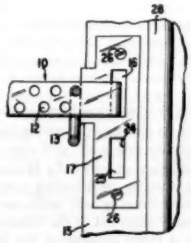
from its first position to its second position, said solenoid means including an armature movable between a projected position corresponding to the first position of said control member and a retracted position corresponding to the second position of said control member, means providing a connection between said armature and control member, and field coil means through which current flows to retract said armature and hold it in its retracted position, said solenoid means being electro-magnetically arranged such that it requires significantly less current to hold said armature in its retracted position against the urging of said spring means than to retract it against such urging.

3,854,764

SAFETY LOCK

John D. Corrigan, 148 E. 48th St., New York, N.Y. 10017

Filed Nov. 1, 1973, Ser. No. 411,835
Int. Cl. E05c 19/18
U.S. Cl. 292—289 8 Claims



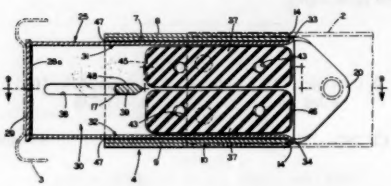
1. In a readily installable and removable safety lock device for locking in closed position a closure for an opening in a frame which closure when in place so as to close said opening is received within said opening with a margin of said closure in proximate abutting spaced relation with respect to a surface of said frame, said device comprising an elongated plate having at least a portion thereof at and adjacent one end of said plate that is sufficiently thin to permit said portion of said plate to be disposed between said surface of said frame and said margin of said closure when said closure is in position to close said opening, the length of said plate being such that when said portion of said plate is disposed as aforesaid and with the longitudinal extent of said plate disposed substantially normally with respect to the plane of said closure the other end of said plate is clear of said frame and said margin of said closure leaving a substantial portion of said plate exposed, a holding hook adjacent said one end of said plate and integral therewith which is adapted to project into a recess in said surface of said frame and which when so positioned is adapted

to hold said plate against withdrawal of said plate when said closure is in position to close said opening, said plate having at least one aperture in the portion of said plate that is exposed as aforesaid when said closure is in closed position and a stop member which passes through said aperture and protrudes laterally substantially from said plate so as to obstruct said margin of said closure and prevent removal of said closure from closed position with respect to said frame, the improvement according to which said stop member is in the form of a ring having an opening therein defined by ring ends which are separated from each other so as to clear said plate in close proximity thereto for permitting said ring to be readily moved into position for its passage through said aperture, said ring ends being substantially parallel to the respective surfaces of said plate when said plate is inserted therebetween and being offset so as to be in substantial non-alignment with each other.

3,854,765
HEAVY-DUTY VEHICLE BUMPER MOUNT CONSTRUCTION

Herman S. Church, Cuyahoga Falls; James L. Hagener, Canton, and Zach M. Scifres, III, Hartville, all of Ohio, assignors to Teledyne Mid-America Corporation, Hartville, Ohio

Filed Apr. 26, 1973, Ser. No. 354,485
Int. Cl. B60r *19/06*
U.S. Cl. 293—88 **4 Claims**

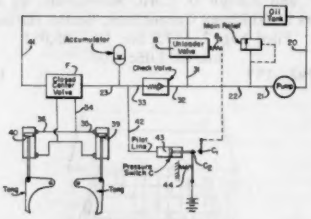


1. In vehicle energy absorbing bumper mount construction of a type including an elongated housing having top and bottom walls and opposite side walls and open at front and rear ends, an elongated beam of generally H-shaped cross section located within the housing, and having a web portion spaced between the opposite housing side walls, and top and bottom flanges spaced closely adjacent to the housing top and bottom walls respectively, a front portion of the H-beam extending outward from the housing interior from the front open end of the housing, the rear end of the H-beam being located adjacent to the rear open end of the housing, and energy absorbing elastic members bonded to opposite surfaces of the web portion and connected to the housing side walls to hold the H-beam within the housing; the combination of the housing top and bottom walls having rear edges which form part of the housing open rear end; ramp formations being formed on the rear end of at least one of the H-beam top and bottom flanges; longitudinally extending slot means formed in the H-beam web portion; anti-pull-out pin means mounted on and extending transversely between the housing side walls and through said slot means preventing the H-beam from being pulled out of the front end of the housing; and the elastic members being prestressed to hold the pin means engaged with the beam web at the rear end of the slot means, and to hold the ramp formations in contact against the housing top and bottom wall rear edges located adjacent said ramp formations to prevent rattle between the H-beam and housing when the H-beam is in usual no-load condition.

3,854,766
LOG GRAPPLE DEVICE

Bertram L. Jordan, Lewiston, N.C. 27849

Filed Apr. 13, 1973, Ser. No. 350,878
Int. Cl. B66c *3/16*
U.S. Cl. 294—88 **2 Claims**



1. A log grapple mounted on a vehicle, said log grapple comprising two tongs that are mounted on said vehicle so as to be movable toward and away from each other, at least one hydraulic cylinder for moving said tongs toward and away from each other, a hydraulic circuit including a hydraulic pump for supplying hydraulic power to said at least one hydraulic cylinder, said hydraulic circuit including:

a. unloader valve means for unloading the hydraulic pump after the tongs have initially obtained a firm grip on a group of logs,

b. means for thereafter sensing any pressure drop in said at least one cylinder that may be due to a slippage or shifting of the logs within the grasp of the grapple,

c. means for automatically and substantially instantaneously restoring the pressure in said at least one hydraulic cylinder to the pressure which existed in said at least one hydraulic cylinder at the time that it attained its initial firm grip on said group of logs.

3,854,767
ROPE ASSEMBLY

Ralph G. Burnett, Kenosha, Wis., assignor to Burnett Company Ltd., Kenosha, Wis.

Filed Aug. 31, 1973, Ser. No. 393,499
Int. Cl. B66c *1/12*; F16g *1/00*
U.S. Cl. 294—74 **8 Claims**

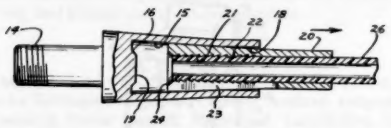
1. A rope assembly which comprises a flexible, hollow, braided rope and a rope end portion inserted into the center of the hollow rope along the longitudinal axis of the hollow rope, the rope end portion being partially retained in the

center of the hollow rope against pullout by the rope braids of the hollow rope gripping the rope end portion within the hollow rope when tension is applied to the hollow rope, and a retaining ring rigidly affixed to a portion of the rope within the hollow rope, said retaining ring comprising retention means for rigidly engaging the ring and rope end portion and barb means for internally engaging the braids of the hollow rope when the rope end portion is pulled relative to the hollow rope to prevent pullout, said retention means comprising first barbs extending inwardly from each end of the retaining ring and said barb means comprising second barbs extending outwardly from one end of the retaining ring.

3,854,768
PIPE PULLING DEVICE

Lloyd H. King, Sr., 311 Blake Rd., Hopkins, Minn. 55343

Filed Jan. 2, 1974, Ser. No. 430,204
Int. Cl. B66c *1/48*
U.S. Cl. 294—102 R **3 Claims**

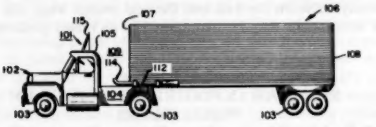


1. A pipe pulling device having in combination
a housing having a closed end,
a holding means extending from said closed end,
said housing having a bore therein extending from the closed end thereof and tapering in the direction of the open other end of said housing,
a tapered boss projecting into said bore from the closed end thereof,
a tubular holding member disposed in said bore and extending outwardly thereof,
said holding member having a plurality of elongated slots therein spaced about the portion thereof disposed within said bore,
said holding member having a bore having non-smooth inner surface, and
said boss being received within the adjacent slotted end portion of said holding member within said bore thereof, said boss having a diameter such as to spread said adjacent end of said last-mentioned bore.

3,854,769
DRAG REDUCER FOR LAND VEHICLES

Walter Selden Saunders, Rt. No. 1, Box 0155, Dillwyn, Va. 23936

Division of Ser. No. 873,234, Nov. 3, 1969, Pat. No. 3,697,120.
This application Aug. 25, 1972, Ser. No. 283,774
Int. Cl. B62d *35/00*
U.S. Cl. 296—1 S **3 Claims**

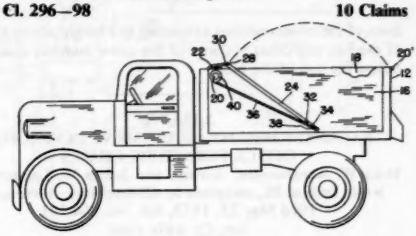


1. A vehicle having a gap formed by a first set of facing sides oriented perpendicular to the line of motion of the vehicle defined by a leading panel of a trailing element of said vehicle and a trailing panel of a leading element of said vehicle, and a second set of facing sides defined by slip streams along the line of motion of the vehicle; drag reducing apparatus comprising a fluid conduit for stabilizing a vortex, the periphery of which is defined by a portion of said first set of facing sides and said slip stream along at least one of said second sets of facing sides when the vehicle is moving through a fluid, one end of said conduit adapted to be located in the center of said vortex and the other end of said conduit adapted to be located in the slip stream alongside the vehicle facing towards the rear of the vehicle.

3,854,770
TRUCK COVER

Frederick G. J. Grise, East Falmouth, and Walter Lovell, North Wilbraham, both of Mass., assignors to Pioneer Coveralls, Inc., North Oxford, Mass.

Filed Nov. 20, 1972, Ser. No. 308,255
Int. Cl. B60p *7/02*
U.S. Cl. 296—98 **10 Claims**



1. The combination with a container having a bottom, side and end walls and an open top, and a cover therefor,
a rotary shaft extending transversely of said container adjacent an end thereof, the cover being rolled about said shaft and having leading end, means to turn the shaft in both directions,
a bow, said bow including a pair of side members, means pivoting the side members on an axis intermediate the ends thereof to the side walls of the container, said bow including a cross member parallel to the shaft, the leading end of the cover on the shaft being connected to said cross member,
a cable having an end connected to wrap on said shaft,
at least one of said bow side members including an extension beyond the pivot axis, the pivot axis being intermediate the ends of the arm of the bow, the other end of the cable being connected to the extending end of said bow side member, rotation of the shaft in one direction tensioning the cable and pivoting the bow in one direction extending the cover over the truck body,
rotation of said shaft in the opposite direction drawing the bow back and wrapping the cover onto the shaft.

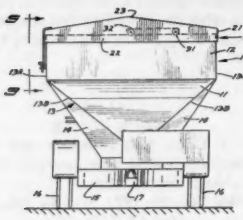
3,854,771
COVER FOR TRAILERS

Robert DuWayne Anderson, Murdock, Minn., assignor to TCI, Inc., Benson, Minn.

Filed Nov. 13, 1972, Ser. No. 305,840
Int. Cl. B60j *7/02*
U.S. Cl. 296—137 B **14 Claims**

1. A removable cover for an open topped storage box having upright walls that are spaced apart, comprising carriage means, track means on the upright walls to mount said carriage means for substantially planar movement transverse to the storage box and along the top of said box, a unitary, one piece cover member, means to pivotally mount said cover member to said carriage means about a single pivotal axis, said track means mounting said carriage means permitting movement of said cover member and carriage means in a transverse direction to position wherein the means to pivotally mount said cover member to said carriage means is positioned with respect to one lateral side wall of said box so that the pivotal axis is adjacent the top of the box and along said one lateral side thereof to permit said cover member to tilt about said

pivotal axis into a substantially vertical position along said one lateral side of said box and on the outside thereof with portions of the cover member extending to a height above the top of the box and other portions of the cover member extending below the top of the box.



3,854,772

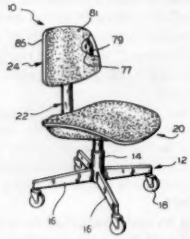
BACKREST HEIGHT ADJUSTMENT DEVICE FOR OFFICE FURNITURE CHAIRS

Dean W. Abrahamson, Aurora, and James W. Lannert, Oswego, both of Ill., assignors to All-Steel Inc., Aurora, Ill.

Filed May 25, 1973, Ser. No. 364,101

Int. Cl. A47c *1/00*

U.S. Cl. 297—353 **8 Claims**



1. In a backrest for office chairs including a support member having its lower end adapted for securement to the chair and a backrest mounted on the upper end of the support member, a device for adjusting the backrest vertically of said support member, said device comprising:

a housing positioned on said support member adjacent the upper end thereof for movement vertically thereof and having the backrest secured thereto,

said support member upper end having an elongated slot formed therein,

said slot extending longitudinally of said support member and being rectilinear in longitudinal configuration,

said slot defining spaced parallel sidewalls extending longitudinally of said support member,

and a cam lock member journaled in said housing,

said cam lock member being journaled for pivotal movement about an axis extending transversely of said support member and said slot and defining a cam lock portion concentric with said axis and received in said slot,

said cam lock portion defining a pair of oppositely disposed cam locking surfaces proportioned transversely of said axis to have equal but opposite binding engagement with said slot side walls within said slot when in contact therewith at points lying on radii extending from said axis that make an angle with the horizontal having a tangent that is less than the coefficient of static friction between said cam lock portion and said slot side walls,

said cam locking surfaces being separated by opposed cam surfaces proportioned transversely of said axis to have slip fit relation with said slot side walls whereby the backrest has free sliding adjustment relative to the support member when said cam locking surfaces are out of contact with said support member slot side walls,

means for selectively pivoting said cam lock member about said axis relative to said housing,

and means for guiding the movement of said housing longitudinally of said slot when said cam locking surfaces are free of binding engagement with said slot side walls.

3,854,773

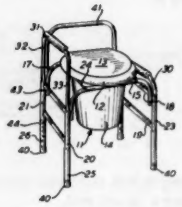
BEDSIDE COMMODE DEVICE

Morton I. Thomas, Monroe, N.Y., assignor to Temco Products, Inc., Passaic, N.J.

Filed June 21, 1973, Ser. No. 372,347

Int. Cl. B60n *1/06;* **A47k** *11/04*

U.S. Cl. 297—417 **2 Claims**



1. A bedside commode device for use adjacent either side of a bed, said device comprising frame means, said frame means comprising a front pair of laterally related and vertically disposed tubular members, a rear pair of laterally related and vertically disposed tubular members, a front inverted U shaped member having a horizontal portion and short depending arm portions interconnecting upper end portions of said front pair of tubular members, a second inverted U shaped member having a horizontal portion and short depending arm portions interconnecting upper end portions of said rear pair of tubular members, seat means mounted on the horizontal portions of said inverted U shaped members, and a pair of laterally spaced side arm support means, each of said side arm means comprising an inverted U shaped member having a horizontal support portion and long depending arm portions, the lower ends of said long arm portions being telescopically mounted in the upper ends of said associated vertically disposed tubular members for raised and lowered movement relative thereto, and latch means for holding said side arm means in a given slidable position, and extension leg members telescopically mounted relative to the lower ends of said vertically disposed tubular members for slidable adjustment relative thereto, and latch means for holding said leg members in a given slidable position, whereby the side arm means immediately adjacent a side of said bed may be independently lowered to a position allowing the occupant of the bed to move laterally between the bed and the seat means while the other side arm means may be maintained in its raised position.

3,854,774

SWING-AWAY FOOTREST FOR INVALID WHEELCHAIRS

Paul D. Limpach, Napoleon, Ohio, assignor to Gendron-Diemer, Inc., Archbold, Ohio

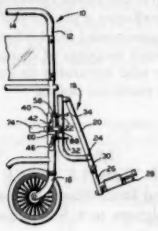
Filed Aug. 6, 1973, Ser. No. 386,043

Int. Cl. A47c *7/50*

U.S. Cl. 297—429 **5 Claims**

1. A latching mechanism for releasable locking a swinging footrest assembly to an adjacent part of a wheelchair upon which the footrest is pivotally supported to swing about a vertical axis comprising:

a plunger affixed to said part normally biased to a latching position, said plunger mounted to reciprocate along an axis;



a washer-like means affixed to said footrest for selective engagement with said plunger; and

lever means pivotally mounted on said part for reciprocating said plunger out of latching position.

3,854,775

MINERAL MINING MACHINE STEERING MEANS

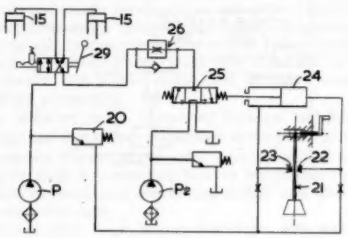
Forrest Symington Anderson, Carluke, Scotland, assignor to Anderson Mavor Limited, Motherwell, Lanarkshire, Scotland

Filed Apr. 6, 1973, Ser. No. 348,538

Claims priority, application Great Britain, Apr. 21, 1972, 18569/72

Int. Cl. E21c *35/06*

U.S. Cl. 299—1 **4 Claims**



1. A mineral mining machine of the type referred to including steering means comprising hydraulic servo control means in a hydraulic circuit operatively connectible to a hydraulic jack for a leading support member on the face side of the machine, adjustable pendulum means oscillatable about an axis parallel to the longitudinal axis of the machine to detect transverse tilting of the machine from a predetermined position and responsive to said tilting to operate a valve member in the hydraulic circuit to provide a pressure differential, said pressure differential applied to an intensifier, said valve member comprising a pair of nozzles aligned with the open ends of a pair of conduits, said conduits connected to opposite ends of said intensifier, a jet disturbing member operatively connected to said pendulum and interposed between said nozzles and said conduits and movable between one extreme position in which the jet disturbing member cuts-off the supply of hydraulic fluid from one nozzle to its associated conduit to another extreme position in which the supply of hydraulic fluid from the other nozzle to its associated conduit is cut-off, said intensifier comprising a double acting piston to actuate valve means, said valve means operable to actuate said leading hydraulic jack to maintain the machine in said predetermined position.

3,854,776

IMPACT MINING MACHINE HAVING CONVEYOR EXTENDING ON FRONT AND SIDE

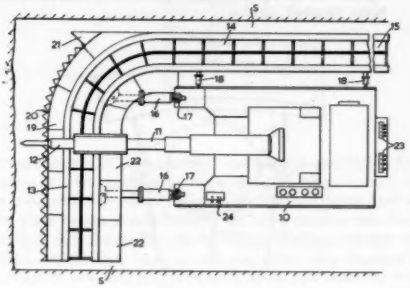
Thomas Polland, Chorley, England, assignor to Dobson Park Industries Limited, Nottingham, Nottingshire, England

Filed June 29, 1973, Ser. No. 375,148

Claims priority, application Great Britain, Oct. 27, 1972, 49618/72

Int. Cl. E21c *27/28*

U.S. Cl. 299—67 **7 Claims**



1. A mining or excavating machine comprising a carriage, a turntable mounted on said carriage, an extensible boom pivotally mounted on said turntable so as to turn therewith and for raising and lowering movement relatively thereto, a mineral working tool mounted on said boom for manipulation thereby in relation to a mineral face to be worked, conveyor-pan-means having a first portion which extends across the front of the carriage and is mounted thereon by means which provide for advance movement of said first portion of the conveyor-pan-means relatively to the carriage, and a second portion which curves rearwardly, with respect to the carriage, from and as a continuation of said first portion and extends alongside the carriage, a scraper-chain-conveyor having a single and centrally located chain positioned in and extending continuously along said first and second portions of the conveyor-pan-means, pressure fluid ram means, connected between the carriage and the first portion of the conveyor-pan-means, for effecting said advance movement of said first portion of the conveyor-pan-means, and collecting means on the front of the first portion of the conveyor-pan-means for advance movement therewith thereby to collect mined or excavated mineral from the front of the machine and directing it into said first portion of the conveyor-pan-means.

3,854,777

SPOKE MOUNTABLE BRACKET ASSEMBLY

James D. Kennedy, Streamwood, Ill., assignor to Beatrice Foods Company, Elgin, Ill.

Filed May 21, 1973, Ser. No. 362,301

Int. Cl. B60b *7/00*

U.S. Cl. 301—37 SA **6 Claims**

1. A display device for mounting on a cycle-type vehicle spoke member comprising a bracket member and a generally flattened body member,

A. said bracket member comprising:

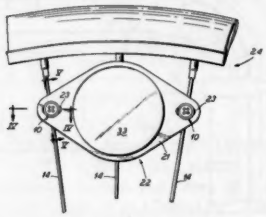
1. a rivet-like means having a longitudinally slotted shank, said shank having a generally uniform cross-sectional configuration, said slot being capable of receiving therein a spoke member, said rivet-like means being formed of rigid but deformable material,

2. a sleeve for mounting circumferentially about said slotted shank and adapted to resist radially outward movements thereof,

3. a screw having a tapered shank which is adapted to engage the outer end portion of said slot of said slotted shank, the length of said tapered shank being less than the length of said slotted shank, the circumferential outer wall of said slotted shank being radially expanded against the inside wall of said sleeve when said screw is turned into said slot and said sleeve is engaged about said slotted shank,

B. said flattened body member having:

1. an aperture transversely defined therein whose size permits said slotted shank to extend therethrough and further permits the head of said rivet-like means to abut against the aperture adjacent portions of said flattened body member, and



2. a central portion adapted for holding a display panel,

C. the interrelationship between the length of each of said shanks, the longitudinal length of said sleeve and the thickness of said adjacent portions of said flattened body member being such that when said bracket member and said flattened body member are engaged with a said spoke member between said flattened body member engaged with a said spoke member between said flattened body member and said rivet head, the length of said slotted shank is slightly less than the combined thicknesses of said spoke, said sleeve longitudinal length and said flattened body member.

3,854,778

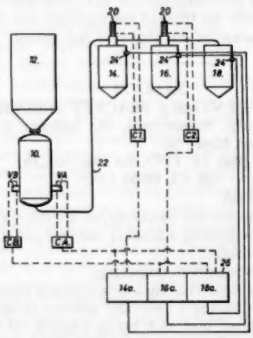
MATERIAL HANDLING PLANTS

William John Courtney Trythall, Whitley Bay, England, assignor to Trythall Design & Development Limited, East Mill, Morpeth, Northumberland, England

Filed Oct. 26, 1973, Ser. No. 409,968

Int. Cl. B65g *53/14*

U.S. Cl. 302—27 **11 Claims**



1. A material handling plant for conveying powder or granular material by a compressed fluid to a selected one of a plurality of receiving points, the plant comprising a hopper, a material conveying apparatus for receiving material from the hopper, a plurality of material receiving points at different distances from said apparatus and in communication with said apparatus via a pipe system, a plurality of material divertor valves each disposed in the pipe system to control the flow of material to a respective one of the receiving points, and means for automatically producing a plurality of different predetermined amounts of compressed fluid whereby in plant use an appropriate one of said amounts of compressed fluid can be employed to enable said apparatus to convey material to a selected one of said receiving points.

3,854,779

ANTI-LOCK VEHICLE BRAKE SYSTEMS

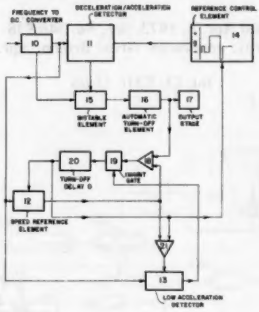
Derek R. Skoyles, and Denis Sharp, both of Salfords, nr. Redhill, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 19, 1973, Ser. No. 352,586

Claims priority, application Great Britain, May 1, 1972, 20105/72

Int. Cl. B60t *8/12*

U.S. Cl. 303—21 P **17 Claims**



1. An electronic control circuit for an anti-lock vehicle brake system, said control circuit comprising, means responsive to an input signal having a quantity which is a function of wheel speed to produce an output signal for causing energisation of a solenoid valve when said quantity has changed at a rate in excess of a first reference rate and by an amount which is greater by a given percentage than its amount of change would have been had its change continued at that first reference rate, the latter corresponding to a first value of wheel deceleration, means for establishing said first reference rate within said control circuit, means for replacing said first reference rate by a second reference rate following the production of said output signal, said second reference rate corresponding to a second value of wheel deceleration that is more negative than said first value, means for replacing said second reference rate by a third reference rate after said second reference rate has persisted for a predetermined period of time, said third reference rate corresponding to a first value of wheel acceleration, and means responsive to said input signal for terminating said output signal to cause solenoid value deenergization when the rate of change of said quantity attains either said second reference rate or said third reference rate, whichever prevails at the time, the prevailing reference rate being replaced by said first reference rate when said output signal is terminated.

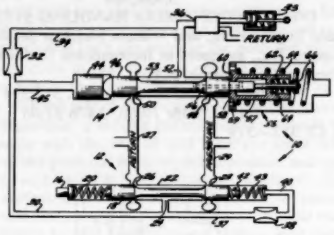
3,854,780
MULTI-STAGE BRAKE VALVE

Wilfred E. Boehringer, Fullerton, and James V. Walker, Redondo Beach, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Division of Ser. No. 170,782, Aug. 11, 1971,. This application June 8, 1973, Ser. No. 368,089

Int. Cl. B60t *11/28*

U.S. Cl. 303—21 F **12 Claims**



1. A valve for controlling the operation of at least one hydraulic brake actuator, said valve including:

a connection to a source of pressurized hydraulic fluid;

a connection to a return of hydraulic fluid;

an output connection for conducting hydraulic fluid to and from said brake actuator;

a first valve stage in communication with said source connection, said return connection, and said output connection, said first valve stage including means to feed inputs thereto and means responsive to the inputs fed thereto to predeterminately conduct the pressurized hydraulic fluid from said source connection to said output connection, to predeterminately conduct the pressurized hydraulic fluid from said output connection to said return connection, and to predeterminately block flow of the hydraulic fluid between said output connection and said source and return connection;

flow restrictor means connected between said first valve stage and said output connection to the brake actuator to generate differential pressures thereacross when said first valve stage is conducting flow of pressurized hydraulic fluid between said source connection and said output connection; and

a second valve stage in communication with said source connection, said return connection and said output connection, said second valve stage including means in communication with the differential pressures generated by said flow restrictor means and responsive thereto to augment the flow of pressurized hydraulic fluid from said first valve stage when a predetermined differential pressure in present across said flow restrictor means.

3,854,781
COMBINED HYDROSTATIC BEARING AND ROLLING BEARING

Sven Christian Bildtsen, Lerum, Sweden, assignor to SKF Industrial Trading and Development Company B. V., Jutphaas, Netherlands

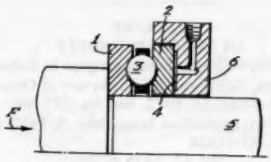
Filed Mar. 16, 1973, Ser. No. 342,278

Claims priority, application Sweden, Apr. 27, 1972, 5548/72

Int. Cl. F16c *32/00*

U.S. Cl. 308—35 **2 Claims**

1. A thrust bearing for supporting at least first and second members for movement relative to one another comprising a rolling bearing assembly including at least a pair of spaced apart rings having confronting raceways and a plurality of rolling elements in the annular space between said rings, one of said rings being mounted on one of said members, and a hydrostatic bearing assembly cooperatively associated with said rolling bearing assembly and including an element mounted on said other member having a surface confronting said other ring, means defining at least one chamber for a fluid medium under pressure formed by at least one pocket in said surface of said hydrostatic bearing element and the outer surface of said other ring whereby in operation of the bearing under applied thrust load, when said chamber is pressurized,



pressurization of said chamber operates to produce a force acting in a line containing the rings and rolling elements and in a direction to counterbalance the applied thrust load and the rings rotate at substantially the same angular rate due to the fact that the friction in the rolling bearing is higher than in said hydrostatic bearing and said other ring engages the surface of said hydrostatic bearing when said chamber is not pressurized whereby said rings rotate relative to one another.

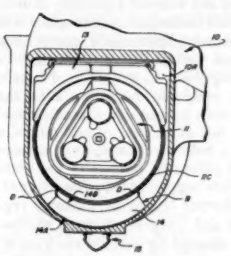
3,854,782
RESILIENT JOURNAL BOX STOP BLOCK

Robert W. MacDonnell, Crete, Ill., assignor to Unity Railway Supply Co., Inc., Chicago, Ill.

Filed Dec. 18, 1972, Ser. No. 316,279

Int. Cl. B60b *35/16;* **F16c** *13/02, 35/00*

U.S. Cl. 308—38 **3 Claims**



1. In an integral journal box arrangement that is modified to accommodate a roller bearing for cooperation with a journal axle, said box having verical side walls and having a bottom wall provided with a central hole for anchoring a stop block in predetermined position against said bottom wall and having an access hole for a stop block assembly tool and said roller bearing having an external cage normally disposed in clearance relation to said stop block and to said vertical side walls, an improved stop block assembly comprising a stop block of elastomeric material, said block having a downwardly stepped vertical hole centrally thereof defining a central lower step portion of said block for registry with the central hole of said bottom wall, said block having a generally arcuate configuration in lengthwise profile to present, when at said predetermined position, corner portions in limited clearance relation to said cage, said corner portions, during impact conditions tending to produce upward and lateral relative movement between said journal box and said roller bearing, undergoing limited deformation in cushioning and restraining movement of the cage sufficiently to prevent contact between the cage

and said box and to limit potential damage to said cage to thereby avoid impairment of said roller bearing, and means disposed in said stepped vertical hole and reacting externally against said bottom wall for anchoring said block into stationary position against the bottom wall of said box, said anchoring means resiliently engaging said stepped vertical hole and the bottom wall of said box such that said block and said box are maintained in engagement when said block assembly is vibrated.

3,854,783

AN ARRANGING SHELF

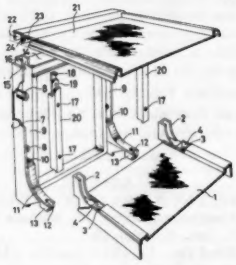
Takeo Teranishi, Fujidera, Japan, assignor to Kabushiki Kaisha Tadapura, Fujiidera City, Prefecture of Osaka, Japan

Filed Oct. 16, 1972, Ser. No. 297,706

Claims priority, application Japan, Mar. 3, 1972, 47-26240; Apr. 18, 1972, 47-41924

Int. Cl. A47b *87/00*

U.S. Cl. 312—108 **2 Claims**



1. An improved shelf which may be easily assembled and disassembled and wherein a plurality of units may be vertically and horizontally arranged as shelf space is required and which presents a pleasing appearance, comprising:

at least one bottom board, a plurality of pillars upwardly extending from each corner of said bottom board and formed integrally therewith, each said pillar having a downwardly curved side extending toward a downwardly curved side of another of said pillars, said bottom board having a hollow region therein adjacent the curved side of each pillar, the portion of the bottom board forming the hollow region having an aperture therein, said bottom board further having an indented region in the bottom thereof and integrally formed therewith, said indented region adapted for vertical stacking of shelf units;

a plurality of side boards having a first set of vertically extending grooves integrally formed therein along the vertical sides thereof, a first set of internally threaded sleeves positioned within said first set of grooves and integrally formed with each side board, a first set of downwardly extending curved members integrally formed with said side boards, one of said members extending from each groove of said first set of grooves, said curved members corresponding in shape to said downwardly curved side of said pillars and having a leg portion at the free ends thereof, said leg portion adapted to fit within the hollow region adjacent each said pillar and having an aperture therein adapted to overlay the aperture in the hollow region of said bottom board through which a fastening member may be inserted, a first set of integrally formed support members extending upwardly from the top of each side board coaxially of each groove, and having an aperture therein on the same side as each groove, and a first plurality of cover members adapted to fit over each of said grooves and having apertures therein corresponding to said internally threaded sleeves, each said cover member having a hook member extending from an end thereof and adapted to be positioned within one of said support members, said hook member extending from the said first set of support members through the apertures; and

at least one top board having regions in the bottom portion thereof adapted to receive said first set of upwardly extending members, said region further having an indented section adapted to receive said hook member therein.

3,854,784

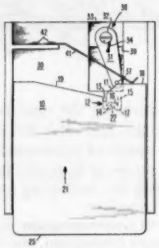
INFORMATION MEDIA HANDLING SYSTEM

Ronald Eugene Hunt, and William Melchior Jenkins, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1972, Ser. No. 310,314

Int. Cl. E05c *19/06;* **A47b** *81/06*

U.S. Cl. 312—319 **11 Claims**



1. An information media handling system comprising in combination:

a hopper for insertion of an information media container therein;

said container including a side having a recessed lock engaging means for engaging an automatic locking means of said hopper, said automatic locking means including a substantially rigid locking arm rotatable in two axes of rotation, so that said container is locked into said hopper by application of a first force in a first direction to said container and released from said hopper by application of a second force to said container in said first direction.

3,854,785

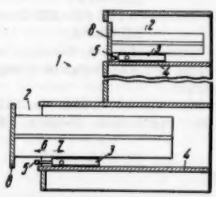
ACTUATING DEVICE

Roland Manner, Weilheim/Teck, and Peter Hueber, Owen/-Teck, both of Germany, assignors to Robert Krause KG Zweigniederlassung Wielheim/Teck, Weilheim/Teck, Germany

Filed Sept. 17, 1973, Ser. No. 397,657

Int. Cl. E05c *7/06;* **A47b** *88/00*

U.S. Cl. 312—319 **18 Claims**



1. A device for causing outward movement of a member such as a drawer or the like from closed position, said device comprising; a frame adjacent the member, a push rod in the frame extending in the direction of movement of said member

and reciprocable in said direction between an inner retracted position and an outward position and having the outer end adapted to engage the member in closed position of the member, a latch bar parallel to and adjacent one side of the push rod and pivoted in the frame, a latch pin extending outwardly from the push rod on the latch bar side, a first spring in the frame biasing the push rod in outward direction, said latch bar having a first control surface along one edge, a first inwardly facing abutment region at the forward end of said first control surface engageable by the side of said latch pin in outward position of said push rod, said first control surface also having an incline leading rearwardly from said first abutment region and along which said latch pin slides as the push rod moves in retracting direction in said frame, a second inwardly facing abutment region at the rearward end of said incline remote engageable with the side of said latch pin to hold the push rod in retracted position, a second control surface on said latch bar engageable with the end of said latch pin upon inward movement of the push rod from retracted position and operable to release said latch pin from said second abutment region, a running surface extending along said latch bar generally parallel to said first control surface and from near said second abutment region to said first abutment region, said running surface adapted for engagement with the end of the latch pin, said latch pin being slidable along said running surface when disengaged from said second abutment region, and a second spring biasing said latch bar about the axis of the pivotal support thereof on said frame in a direction toward said first control surface.

3,854,786

METHOD OF MANUFACTURING A HALOGEN INCANDESCENT LAMP

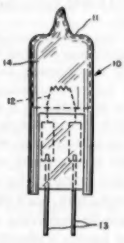
Victor Rosallie Notelteirs, and Ferdinandus Maria Josephus Van Beek, both of Emmasingel, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 30, 1973, Ser. No. 355,906

Claims priority, application Netherlands, May 31, 1972, 7207324

Int. Cl. H01j *9/38*

U.S. Cl. 316—20 **3 Claims**



1. A method for manufacturing a halogen incandescent lamp comprising:

providing a generally transluscent envelope having a filament disposed therein and external terminals connected to said filament;

forcing a gas mixture comprising an inert gas and at least one hydrocarbon halide compound into the envelope;

sealing the envelope;

cooling said lamp to a temperature below the condensation temperature of the inert gas present in the gas mixture; and

immediately operating the lamp comprising said sealed envelope, filament and terminals to decompose the hydrocarbon halide compound into carbon and hydrogen halide.

3,854,787

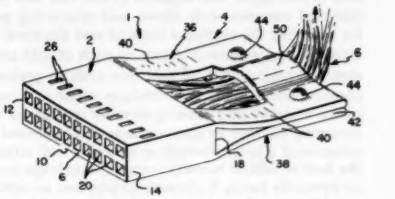
INTEGRAL HOUSING AND STRAIN RELIEF

Clair Wilson Snyder, Jr., Hellam, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 313,021, Dec. 7, 1972, abandoned. This application Mar. 5, 1973, Ser. No. 337,774

Int. Cl. H01r *13/58*

U.S. Cl. 339—103 R **8 Claims**



1. In a connector having a plurality of electrical terminals electrically connected respectively to a plurality of conductors and received within a housing of insulation material, a strain relief for the conductors, comprising: first and second arms on said housing receiving said conductors, said arms being relatively thin and flexible substantially along their lengths, said arms further being flexibly deflected toward each other to grip said conductors therebetween, and said arms being joined together and abutting at their free ends to form a non-flexible and non-deflectable triangular truss connected to said housing and extending outwardly from said housing in gripping relationship on said conductors at a location spaced from said housing, thereby providing a strain relief resisting twisting and bending of said conductors with respect to said terminals and said housing.

3,854,788

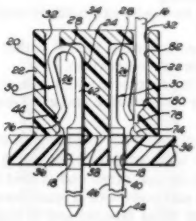
ELECTRICAL CONNECTOR ASSEMBLY

David S. Goodman, Orange, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 28, 1973, Ser. No. 336,694

Int. Cl. H01r *13/42*; **H05k** *1/04*

U.S. Cl. 339—176 M **3 Claims**



1. An electrical connector assembly for receiving an electrical circuit element having electrical leads extending therefrom comprising:

a planar mounting member having openings therein:

an electrical contact mounted in each of said openings, said contact having a mounting section press-fit into said opening, a generally hook-shaped blade section extending upwardly from said mounting section and terminating in a free end, and a lower end section extending downwardly from said mounting section, said hook-shaped blade section including an upper reverse bent portion and a convex contacting portion between said reverse bent portion and said free end;

an insulated housing member on said mounting member having a plurality of compartments receiving said hook-

shaped blade sections of said contacts, said compartments opening at the bottom of said housing member and being dimensioned to slidably receive said contact hook-shaped blade sections thereinto from said bottom thereby permitting said housing member to be mounted over said contacts onto said mounting member, said housing member having a side wall adjacent to said contacting portions of said contacts and an upper wall, said upper wall extending over said reverse bent portions of said contacts, slots in said upper wall adjacent to said side wall opening into said compartments above said contacting portions for receiving the electrical leads of said electrical circuit element, and abutment means in each of said compartments engaging each of said free ends to preload said contacts and to retain said contacts within said compartments whereby said housing member is retained on said mounting member by said contacts, said abutment means comprising a ledge formed on said side wall adjacent to the bottom of said housing member, said ledge providing an upwardly facing horizontal surface and an upstanding shoulder in each said compartment engaged by said free end of said contact.

3,854,789

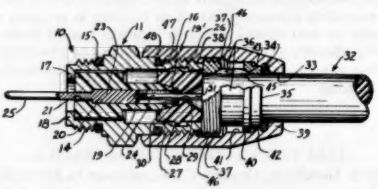
CONNECTOR FOR COAXIAL CABLE

Eric S. Kaplan, 20 Beach Tree Rd., West Caldwell, N.J. 07006

Filed Oct. 2, 1972, Ser. No. 294,237

Int. Cl. H01r *17/04*

U.S. Cl. 339—177 R **2 Claims**



1. A connector for coaxial cable having an outer shield and a central insulated conductor with a portion extending from the shield comprising

a hollow body having an externally threaded portion on one end thereof,

slotted tubular insulating means within the said housing having a tapered end portion,

a slotted female receptacle within the slotted tubular insulating means for receiving said extending central conductor portion,

the other end of said body including an externally threaded portion and said receptacle including a conductive pin extending from said other end of said body,

a collet within said body with at least one end of the opening in said collet being tapered and in engagement with the tapered portion of said insulating means,

a nut threadably engaging said body and including cable gripping means through which said coaxial cable extends and means carried by said nut for sealing said cable in said nut and sealing means carried by said body for forming a seal between said body and said nut,

said gripping means gripping said outer cable shield when said cable is inserted through the nut and the conductor portion is in engagement with said receptacle.

whereby the inward displacement of the nut upon being tightened urges the end of said cable against said collet and displaces said collet inwardly,

the inward movement of the collet forcing its tapered portion into tight engagement with the tapered portion of said insulating means thus reducing the diameter thereof and urging the walls of said receptacle into tight engagement with said conductor portion, and said gripping means in said nut further including a split metal collet having externally tapered end portion of the opening therein tapered to receive an end of said metal collet, said collars and metal collet being slidably retained with said nut, one of said collars engaging the end of said body when said nut is placed in threaded engagement therewith whereby tightening said nut decreases the distance between said collars and thereby effects a reduction in diameter of said split collet causing it to firmly grip the coaxial cable and make electrical contact therewith.

3,854,790

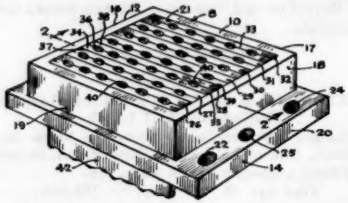
ELECTRICAL CONNECTOR ASSEMBLY

Jerry Provinsky, Westmont, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sept. 17, 1973, Ser. No. 397,994

Int. Cl. H01r *9/00*

U.S. Cl. 339—198 GA **16 Claims**



1. An electrical connector assembly comprising a box-like housing with upper and lower open ends and at least one pair of opposite outer sides,

a plurality of electrical connectors including a plurality of multi-piece dielectric inserts with opposite ends disposed adjacent said pair of opposite sides of said housing to form two sets of retention members, and a plurality of electrical contacts arranged in a row between said ends and retained in each of said inserts, said connectors being disposed in side-by-side relation within said sides, facing said upper end for engagement with mating connectors and including lower portions for electrical engagement with electrical conductors, each of said connectors being capable of rearwardly receiving a flat multi-conductor cable with an end having a plurality of apertures, a portion thereof providing electrical access to the conductors, each of said inserts including a lower portion with an elongated opening sized for entry of said cable into said insert, and each of said contacts including a lower tail formed as a hook to engage one of said apertures and thereby provide electrical engagement with one of said conductors, and

means for releasably retaining said connectors individually in said housing including a row of integrally-formed, individually yieldable latching elements and spaced apart shoulder means to form grooves therebetween on one of said retention members in each of said two sets, projection means with upper and lower shoulders on the other of said retention members to ride over the latching elements and snap into said grooves, and access means in at least one of said retention members for release of said latching elements.

3,854,791
HOLOGRAPHIC MEMORY WITH RANDOM PHASE ILLUMINATION HOLOGRAM

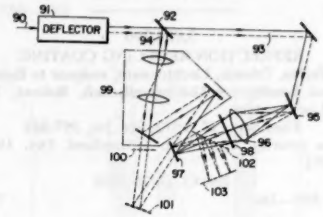
Yasutsugu Takeda, Kokubunji, and Yoshitada Oshida, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 118,617, Feb. 25, 1971, Pat. No. 3,744,871. This application Apr. 21, 1972, Ser. No. 246,412

Claims priority, application Japan, Apr. 22, 1971, 46-26365; Sept. 11, 1971, 46-60298The portion of the term of this patent subsequent to July 10, 1990, has been disclaimed.

Int. Cl. G02b *27/00*

U.S. Cl. 350—3.5 **3 Claims**



1. A Fourier transform holographic memory apparatus comprising:

first means for providing a first beam of coherent light;

second means for providing a second beam of coherent light, said second means comprising:

a beam splitter disposed to receive said first light beam provided by said first means and to extract a portion of the light in said first beam as said second beam, and further including means for directing said second beam along an optical path separate from said first beam;

third means, disposed in the path of said first beam, for modifying said first beam and comprising:

a light modulator having a plurality of elements arranged in matrix form, for modulating said first beam in accordance with information supplied thereto,

a lens, and

a random phase illumination hologram which provides at least three random step-wise phase shifts to light passing therethrough, including a plurality of elements arranged in the same manner as the elements of said light modulator and having at least three different step-wise varying optical path lengths distributed at random, each of which corresponds to an individual information element and is substantially constant, so that light waves diffracted by the elements of the light modulator have at least three different phases, and

wherein said random phase illumination hologram, said light modulator and said lens are disposed optically in series; and

fourth means, disposed to receive both said modified first beam and said second beam, for recording the interference pattern resulting from the impingement of said modified first beam and said second beam thereon, said fourth means comprising a recording medium disposed at the back focal plane of said lens.

3,854,792
FIBER OPTIC SECURITY SEAL

Alfred R. Koelle, Los Alamos, N. Mex., assignor to The United States of America as represented by the Atomic Energy Commission, Washington, D.C.

Filed Mar. 22, 1973, Ser. No. 343,988

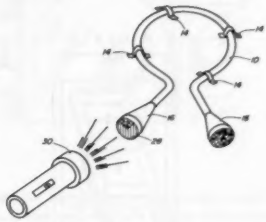
Int. Cl. G02b *5/16*

U.S. Cl. 350—96 B **5 Claims**

1. A security seal installable through a seal receiving means comprising:

a fiber optic bundle passable through said seal receiving means; first means for securing all fibers in said bundle in fixed relation to one another at one end of said bundle, said first securing means being of a configuration incapable of being passed through said receiving means;

second means for securing all fibers in said bundle in fixed relation to one another at the other end of said bundle,



said second securing means being of a configuration incapable of being passed through said receiving means;

said fibers in said bundle being randomly distributed such that the relative position of said fibers is different at each cross-section along the length of said bundle; and

means for masking one of said ends so that upon illumination of said one end, a pattern of illuminated fiber ends appears at said other end.

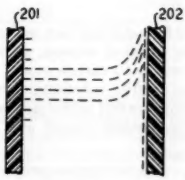
3,854,793
LIQUID CRYSTAL CELLS

Frederic Jay Kahn, Stirling, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 27, 1972, Ser. No. 266,587

Int. Cl. G02f *1/16*

U.S. Cl. 350—160 LC **4 Claims**



1. In combination

a thin film of liquid crystal material,

first and second substrates,

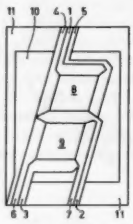
spacing means positioned between said substrates, said substrates and spacing means thereby defining an envelope surrounding said thin film,

a layer of bonding material chemically bonded to at least one of said substrates and positioned substantially contiguous with said thin film wherein said bonding material is N,N-dimethyl-N-octadecyl-3-aminopropyltrimethoxysilyl chloride.

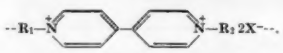
3,854,794
IMAGE DISPLAY CELL

Hendrik Tajapko Van Dam; Johannes Jacobus Ponjee, and Cornelis Johannes Schoot, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

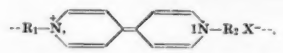
Filed Dec. 11, 1972, Ser. No. 313,822
Claims priority, application Netherlands, Dec. 23, 1971, 7117713
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 R **8 Claims**



1. An image display cell comprising a casing having a transparent wall part a reducible redox substance and an oxidizable redox substance in water within said casing and at least two inert electrodes in contact with said water, both the reducible redox substance and the oxidizable redox substance being present in the cell, said reducible redox substance having a solubility in water in excess of 10^{-2} mole/liter and being a compound of the formula I



said oxidizable redox substance having a solubility product in water of less than $5x\ 10^{-5}$ mole/liter and being a compound of the formula II



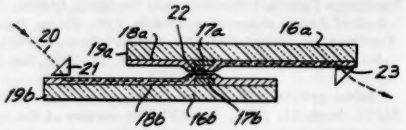
R_1 and R_2 in said formulae are each moieties selected from the group consisting of alkyl, alkenyl, alkoxycarbonylalkyl and phenylalkyl of one to 10 carbon atoms, halogen substitution products thereof, nitrile substitution products thereof and morpholinocarbonylmethyl substituted with up to two methyl groups in the morpholina moiety and X^- is a monovalent anion.

3,854,795
LIGHT MODULATION DEVICE

Masanori Honda, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 26, 1973, Ser. No. 326,950
Claims priority, application Japan, Feb. 1, 1972, 47-11719; Feb. 4, 1972, 47-12648; Feb. 4, 1972, 47-12649
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 R **14 Claims**

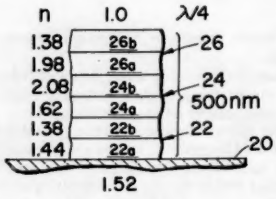
1. A light modulation element, comprising
a pair of substrates;
a pair of electrodes each on a corresponding one of the substrates; and
a pair of layers of semiconductor material having the Franz-Keldysh effect each covering a corresponding one of the electrodes, the substrates being positioned in overlapping relation with each other with the semiconductor layers facing each other, the semiconductor layers being independent from each other and in loose removable abutment with each other.



3,854,796
REFLECTION-REDUCING COATING

Alfred Thelen, Triesen, Liechtenstein, assignor to Balzers Patent-und Beteiligungs-Aktiengesellschaft, Balzers, Furstentum, Liechtenstein

Filed Sept. 17, 1973, Ser. No. 397,851
Claims priority, application Switzerland, Oct. 19, 1972, 015336/72
Int. Cl. G02b *5/28*
U.S. Cl. 350—164 **7 Claims**

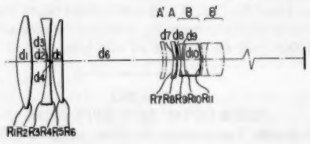


1. A reflection-reducing coating for a substrate comprising a plurality of layers wherein, in the order of enumeration starting from the substrate, there are, three groups of at least two lambda/4 layers, the successive layers of the first group having a refractive index decreasing below the refractive index of the substrate, the layers of the second group having an increasing refractive index and the layers of the third group having a refractive index decreasing below the refractive index of the substrate.

3,854,797
METHOD FOR FOCUSING TELEPHOTO TYPE OPTICAL SYSTEM

Hideo Yokota, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1973, Ser. No. 354,704
Claims priority, application Japan, June 7, 1972, 47-56076
Int. Cl. G02b *9/00, 9/64, 9/60*
U.S. Cl. 350—214 **15 Claims**



1. In a method for focusing, on an image plane, a telephoto-type objective lens system having front and rear lens groups disposed in rearward succession along an optical axis between an object and the image plane, the front lens group being of positive power and the rear lens group having at least two lens members, the improvement which comprises the step of simul-

taneously moving the frontmost and rearmost members of the rear lens group in respectively opposite axial directions while the front lens group is held stationary.

3,854,798

REPRODUCTION LENS SYSTEM

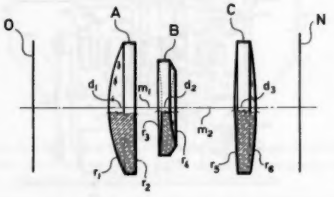
Miloslav Paukert, Prerov, and Marie Vasicova, Rokytnice U Prerova, both of Czechoslovakia, assignors to MEOPTA, narodni podnik, Prerov, Czechoslovakia

Filed June 7, 1973, Ser. No. 367,848

Claims priority, application Czechoslovakia, June 8, 1972, 3961-72

Int. Cl. G02b *9/16*

U.S. Cl. 350—226 **1 Claim**



1. An objective lens system for reproduction comprising three components spaced one from another by an airspace and arranged in such a manner that the outer component on the image-plane side is a simple concave-convex element and the outer component on the object-plane side is a simple biconvex element while the middle component is a simple biconcave element, said system having the following parameters:

			n_d	ν
$r_1 = +$	25.11			
		$d_1 =$	5.14	1.65844	50.8
$r_2 = +$	2844.42			
		$m_1 =$	4.75	air	
$r_3 = -$	79.796			
		$d_2 =$	1.36	1.66680	33.1
$r_4 = +$	24.54			
		$m_2 =$	11.74	air	
$r_5 = +$	142.77			
		$d_3 =$	3.88	1.65844	50.8
$r_6 = -$	64.56			

where $r_1 - r_6$ are the radii of curvature of the individual refracting surfaces, $d_1 - d_3$ are the axial thicknesses of the individual components, m_1 and m_2 are the airspaces between the individual components, n_d is the refracting index for the D-line of the spectrum and ν is the Abbe number, the focal length F having a value of 100, and the measurements taken in mm.

3,854,799

REFLECTING DEVICE CONSTRUCTION

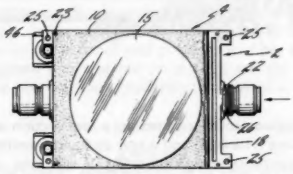
Angelo J. Sciacca, Juno, and Thomas B. Milam, Jupiter, both of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Jan. 26, 1973, Ser. No. 327,024

Int. Cl. G02b *5/08*

U.S. Cl. 350—310 **7 Claims**

1. A laser mirror including first means having a reflecting surface on one side and a mounting surface on the other side, a mount block for supporting said first means, a mounting pad means for connecting said mounting surface of said first means to said mount block, said mounting pad means having pads thereon, said pads being interconnected to properly locate them in relation to the mounting surface and to accommodate thermal movements between the mounting pad means and first means, said pads having surfaces fixed to the mounting surface, three mounting projections extend from said mounting pad means towards said mount block, said mount block having three seats for receiving the three mounting projections of said mounting pad means, said mount block being formed having two arms for preventing a transfer of excess force between the mount block and said first means,



one of said seats for receiving the mounting projections being located adjacent the end of each of the two arms, the third seat being located on the other part of the mount block, each of said mounting projections being positioned in its cooperating seat and attached to said mount block, said two arms being formed to limit the amount of force transmitted between the mount block and the first means.

3,854,800

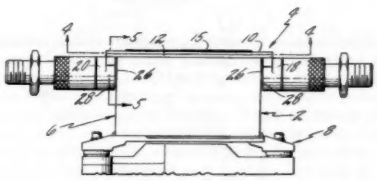
REFLECTING DEVICE CONSTRUCTION

John A. Dye, Lake Park, and Joe F. Arnold, North Palm Beach, both of Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Jan. 26, 1973, Ser. No. 326,913

Int. Cl. G02b *5/08*

U.S. Cl. 350—310 **3 Claims**

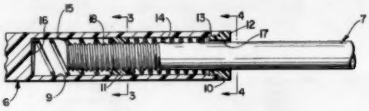


1. A laser mirror including means for reflecting a high-power high-quality beam while maintaining a high quality, said means including a face plate, a closure plate fixed thereto, one of said plates having a plurality of grooves therein facing the other plate, one of said plates having a first slot connecting the grooves at one end, one of said plates having a second slot connecting the grooves at the other end, a first manifold connected to said plate containing said first slot for directing a coolant to said first slot, said first manifold extending away from said plate to which it is connected, a second manifold connected to said plate containing said second slot for directing a coolant away from said second slot, said second manifold extending away from said plate to which it is connected, a backing member being located between said first and second manifolds, said backing member having a flat surface, said closure plate having a bottom surface bonded to said flat surface of said backing member, said backing member having mounting means fixed thereto, said first and second manifolds extending away from said closure plate in a cantilevered manner, said manifolds being spaced from the sides of the backing member, a reflecting surface being located on said face plate.

3,854,801
ADJUSTABLE EYEGLASS TEMPLE

Neil A. Hoke, Federal Hwy. 224, Bloomville, Ohio 44818

Filed July 11, 1973, Ser. No. 378,193
Int. Cl. G02c 5/20, 5/16
U.S. Cl. 351—118 2 Claims

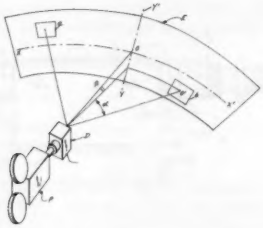


1. An eyeglass temple comprising a rear section and a front section having a forward and a rear end and provided with an elongated recess opening outwardly of said rear end, a nut slidably and non-rotatably engaging in said recess, a cap detachably connected to the rear end of said front section, a compression spring confined between the nut and cap, said rear section having a forward and a rear end, said cap having a bore slidably and rotatably receiving said forward portion of said rear section, said forward portion extending through said spring and including a threaded forward end threadedly engaging in said nut and rotatable therein for varying the overall length of the temple, and said rear section having a rear end adapted to engage behind the ear of the user.

3,854,802
IMAGE RECORDING AND PROJECTION METHOD AND APPARATUS

Midhat Joseph Gazale, 96 Quai Louis Bleriot, Paris 16 eme, France

Filed July 30, 1973, Ser. No. 383,813
Claims priority, application France, Aug. 2, 1972, 72.27938
Int. Cl. G03b 37/02
U.S. Cl. 352—40 63 Claims



1. A method for recording and subsequently projecting pictures successively onto various areas of a substantially oversized screen in a predetermined pattern comprising the steps of:

A. recording on a storage medium a pictorial image;

B. recording on a storage medium an indicator in site-azimuth code of the relative projection position to be associated with the image, the orientation of the image recording apparatus being recorded in real time in the course of image recording as the associated indicator;

C. reading the storage medium containing the associated indicator and adjusting the projection orientation of a projection system exclusively in accordance with information contained in the associated indicator; and

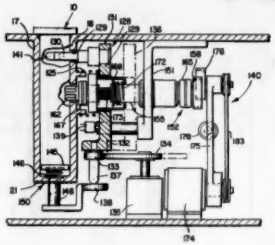
D. reading the storage medium containing the image and projecting the image through the projection system onto a screen substantially oversized relative to the projected image;

whereby upon projection of the image according to the associated indicator the image is projected onto a region of the screen corresponding to the real time position of the image during recording.

3,854,803
PHOTOGRAPHIC APPARATUS FOR PROVIDING AUTOMATIC CASSETTE OPERATION

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 227,093, Feb. 17, 1972, abandoned.
This application Jan. 2, 1974, Ser. No. 429,725
Int. Cl. G03b 23/02
U.S. Cl. 352—72 22 Claims



1. Photographic apparatus for use with a photographic cassette including a housing configured to retain a strip of photographic film and means responsive to external drive means for advancing such film strip within such cassette, said apparatus comprising:

means for receiving such cassette in operative relation with said apparatus for purposes of actuating such cassette through a predetermined program, said receiving means including a cassette-receiving well;

means for latching such cassette in said well, said latching means including a shaft member configured for displacement from a first position alongside said well to a second position extending at least partially across said well and into engagement with such cassette;

selectively operable means for operating such cassette through a preprogrammed sequence, said operating means including drive means independent of said latching means, said drive means being mounted for displacement from a first position alongside said well to a second position within said well and in engagement with the advancing means of such cassette when such cassette is operatively located in said well; and

means responsive to location of said latching means in other than its said second position for preventing operation of said opeating means including preventing displacement of said drive means to its said second position.

3,854,804
FILM CARTRIDGE

Clarence O. McMaster, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 26, 1973, Ser. No. 326,885
Int. Cl. G03b 23/02
U.S. Cl. 352—78 R 4 Claims

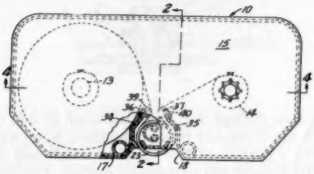
1. A film cartridge for use with a document camera which will permit insertion and removal of the cartridge after the cartridge is initially inserted and prior to exposure of the entire film without complete rewinding, said cartridge comprising

a housing formed of interfitting plastic part means for producing a light-tight compartment having large-area sidewalls and edge walls extending substantially around the periphery of said sidewalls to join said sidewalls with the discontinuity of said edge walls defining a rectangular

opening along one edge of the housing extending between said sidewalls,

means defining a pair of spools disposed within said compartment between said sidewalls for supporting a length of film and said spools being capable of receiving an exterior driving force,

a roller positioned within said compartment and having a hollow cylindrical portion and an outer cylindrical periphery which defines a film supporting surface, said roller being positioned with the axis thereof extending in a direction between said sidewalls and with the periphery projecting through said opening in said edge wall, said



roller also having a stub shaft coaxial with said cylindrical portion and supported from a support positioned within said cylindrical portion,

a pin supported by one said sidewall and projecting toward the other sidewall and into said hollow cylindrical portion of said roller, and

a spring secured to said stub shaft and to said pin for biasing said stub shaft and said roller outwardly of said compartment toward said opening and into contact with said edge walls defining said opening to lock the film when the cartridge is not in a camera and to align the roller with a pair of capstans when in a camera.

3,854,805

EXPOSURE TIME CONTROL MECHANISM FOR MOTION PICTURE CAMERA

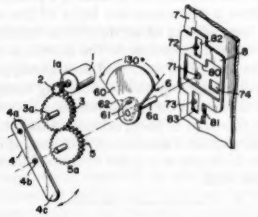
Takashi Tobioka, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya-shi, Japan

Filed Sept. 13, 1973, Ser. No. 396,892

Claims priority, application Japan, Sept. 14, 1972, 47-92505

Int. Cl. G03b *17/46*

U.S. Cl. 352—121 **6 Claims**



1. An exposure time control mechanism for a motion picture camera comprising a rotary shutter blade having a sector portion for closing and opening an aperture of the camera by rotation thereof, a vertically slidable claw plate having a film feed claw and a cam follower portion, a cam means provided on said rotary shutter blade and engaged with said cam follower portion of said claw plate to move said claw plate up and down as the shutter blade rotates, a driving gear driven by a driving source provided in the camera, a transmission means provided in association with said driving gear and said rotary shutter blade for transmitting the rotation of the driving gear to the shutter blade, and a switch means for selectively operating said transmission means to intermittently or continuously transmit the rotation of the driving gear to the shutter blade, said transmission means comprising two projections fixed on said driving gear and a pin fixed on said shutter blade to be engaged with said projections, said switch means comprising a movable switch member which is movable between two positions and operably associated with said transmission means, in one of said positions said pin being continuously engaged with one of said projections and the rotation of the driving gear being continuously transmitted to the shutter blade, and in the other of said positions said pin being alternately engaged with said two projections and the rotation of the driving gear being intermittently transmitted to the shutter blade.

3,854,806

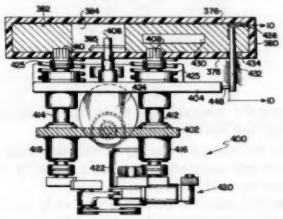
PHOTOGRAPHIC APPARATUS FOR USE WITH A FILM HANDLING CASSETTE HAVING FILM STRIP TENSION REGULATING MEANS THEREIN

John R. Sharp, Squantum, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 214,548, Jan. 3, 1972, Pat. No. 3,756,707. This application Sept. 4, 1973, Ser. No. 393,884

Int. Cl. G03b *23/02*

U.S. Cl. 352—130 **8 Claims**



1. Motion picture apparatus comprising: an apparatus housing; means in said apparatus housing for receiving and supporting a multi-purpose film handling cassette at an operative position within said apparatus housing, the cassette being of the type including a cassette housing, a length of photographic film strip stored on a reel within the cassette housing; means providing access into the cassette housing for light to be directed toward an incremental section of the film strip as the film strip is transported, in an intermittent manner, past the access means to facilitate film exposure or projection operations, a processing station in the cassette housing past which the film strip is transported, in a continuous manner, during a processing mode of operation for coating at least an elongated portion of the film strip with a fluid processing composition and film strip tension regulating means movably mounted within the cassette housing and being engagable by the film strip for movement along a path of travel between initial and energized positions, in response to intermittently transporting the film strip past the access means, for forming and continuously maintaining a feed loop of film strip between the reel and the access means to isolate that portion of the film strip near the access means from an inertial drag of the reel, the tension regulating means also being movable, by the film strip, along the path of travel from the initial position past the energized position as the film strip is transported in a continuous manner during a film processing mode of operation, for guiding the fluid coated film strip towards the reel; said motion picture apparatus further including film transport means in said apparatus housing for transporting the film strip in the cassette housing past the access means of the cassette, in an intermittent manner, to facilitate exposure or projection operations and for transporting the film strip past the processing

station of the cassette, in a continuous manner, to facilitate the application of the coating of fluid processing composition to the film strip; and stop means in said apparatus housing positionable in the path of travel of the film tension regulating means of the cassette for stopping movement of the film tension regulating means when the film tension regulating means moves past its energized position during the film processing mode of operation to assure that the film tension regulating means is stabilized and does not adversely affect the fluid coating applied to the film strip.

3,854,807

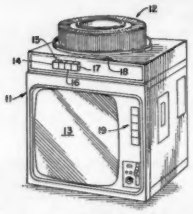
SLIDE TRAY POSITIONING MECHANISM FOR A REAR-SCREEN PROJECTOR

Roy E. Hickey, Honeoye Falls, N.Y., assignor to The Singer Company, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,469

Int. Cl. G03b *21/14*; **G03b** *23/06*

U.S. Cl. 353—78 **8 Claims**



1. Apparatus for positioning a slide tray comprising:

a slide projector including a gate;

a slide tray including a plurality of indexing pins depending therefrom and adapted to contain a plurality of slides for projection by said projector;

indexing means adapted to rotate said slide tray relative to said gate for successively bringing slides in said slide tray, one at a time, into substantially vertical register with said projector gate;

said indexing means including:

a driven indexing bar having a slide tray indexing element at one end thereof;

pivoted means including a rotatably pivoted, substantially flat, member having a slot therein a distance from said pivot; coupled to said indexing bar by means of a pin depending from said driven indexing bar and extending into said slot in said pivoted member; said pivoted means guiding said indexing element to a position between two adjacent pins depending from said slide tray and then rotating said indexing bar around the pivot of said pivoted means to rotate said slide tray as said indexing bar is driven.

3,854,808

METHOD AND DEVICE FOR PRODUCING PRINTS AND THE LIKE

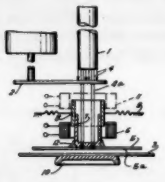
Horst Germer, Braunschweig, Germany, assignor to Triumph Werke Nurnberg Aktiengesellschaft, Nurnberg, Germany

Continuation of Ser. No. 59,134, July 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 405,330, Oct. 13, 1964, abandoned. This application Jan. 26, 1973, Ser. No. 326,864

Int. Cl. B41b *13/00*

U.S. Cl. 354—5 **13 Claims**

1. A method of producing selected visible characters on successive portions of at least one recording area, comprising the steps of operating a selected one of a plurality of key means for positioning a selected one of a plurality of character forming masks adjacent a selected portion of the recording area; influencing a beam of thermal radiation by the selected character forming mask so as to project a modified beam of radiation having an outline corresponding to the selected character to be produced toward colored particles which soften when irradiated and which are connected to one face of a band facing said recording area; moving said band in a first direction substantially parallel to and spaced from said



recording area through said modified beam so that the particles which are irradiated by said modified beam will soften; and moving a portion of said band on which said irradiated particles are located and an opposite portion of said recording area relative to each other in a second direction transverse to said first direction so that said irradiated softened particles will contact and adhere to a selected portion of said recording area to thus produce visible characters thereon.

3,854,809

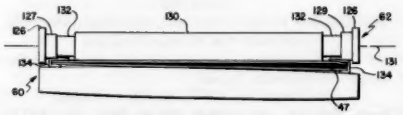
PHOTOGRAPHIC APPARATUS

John J. Driscoll, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 229,669, Oct. 24, 1972, abandoned. This application July 2, 1973, Ser. No. 375,339

Int. Cl. G03b *17/50*

U.S. Cl. 354—86 **35 Claims**



1. Photographic apparatus for spreading a processing composition across a photosensitive layer of an exposed film unit comprising:

pressure-applying means adapted to engage opposite sides of an exposed film unit for spreading a processing composition across a photosensitive layer of the exposed film unit in a layer having an asymmetrical thickness, as measured in a plane transverse to the direction of movement of the film unit relative to said pressure-applying means, said pressure-applying means including means defining a longitudinally extending, asymmetrically configured gap when the film unit is being advanced therebetween, said gap tapering from a maximum thickness at one end to a minimum thickness at a point more than halfway toward its opposite end.

3,854,810

SYNCHRONIZING MECHANISM FOR FLASH AND SHUTTER ACTUATION

Helmut Ettischer, Ruit, and Peter Huschle, Boblingen, both of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 4, 1973, Ser. No. 366,399

Claims priority, application Germany, July 24, 1972, 2236183

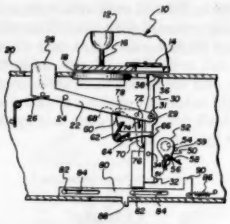
Int. Cl. G03b *15/04*

U.S. Cl. 354—142 **6 Claims**

1. For use with flash units of the type having at least one lamp fireable by striking and at least one pre-energized striker

releasable to effect such striking, photographic apparatus comprising:

a shutter;



means for receiving such a flash unit; and

means for releasing a pre-energized striker of a received flash unit and for actuating said shutter in response to receipt of a force from the released pre-energized striker during movement to effect such striking.

3,854,811

DELAY MECHANISM FOR A SINGLE LENS REFLEX CAMERA MIRROR DRIVE

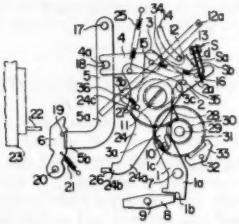
Kunihiko Araki, Yokohama, Japan, assignor to Ricoh Co. Ltd., Tokyo, Japan

Filed Nov. 21, 1973, Ser. No. 417,933

Claims priority, application Japan, Nov. 30, 1972, 47-120444; Nov. 30, 1972, 47-120445

Int. Cl. G03b *19/12*

U.S. Cl. 354—153 **10 Claims**



1. In a single-lens reflex camera having:

a. an optical system with a focussing light path to a finder and a taking light path to the film;

b. a diaphragm for setting the opening of said light paths;

c. a photometry system for sensing incoming light on the focussing light path to said finder;

d. a shutter for opening the taking light path to the film;

e. a shutter release;

f. a reflecting mirror disposed in said light paths for directing the incoming light to said focussing light path and said photometry system and movable to close said focussing light path and open said taking light path to the film upon the acutation of said shutter release; and

g. a film winding mechanism; wherein the improvement comprises:

h. diaphragm operating means for setting the opening of said diaphragm upon the actuation of said shutter release;

i. mirror drive means operatively coupled to said diaphragm operating means for moving said mirror out of the taking light path in response to the setting of said diaphragm;

j. delay means for delaying the operation of said mirror drive means until the setting of said diaphragm is stabilized; and

k. switch means actuated at the termination of the operation of said delay means for instantaneously operating said photometry system.

3,854,812

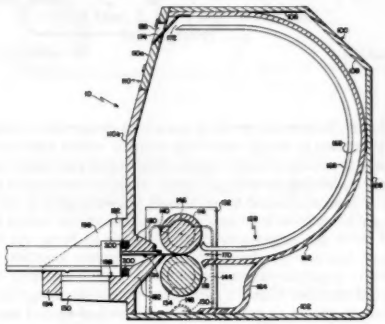
PHOTOGRAPHIC PROCESSOR FOR LARGE FORMAT FILM UNITS

Duncan C. Sorli, Chelmsford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 29, 1972, Ser. No. 319,489

Int. Cl. G03d *9/02*

U.S. Cl. 354—312 **8 Claims**



1. A processor for providing a lighttight environment for a film unit including photosensitive and image-receiving layers and for distributing a fluid processing composition between predetermined layers of the film unit, such a film unit being of the type including a film unit tab extending forwardly of a leading end of the film unit, said processor comprising:

a housing having a lighttight chamber therein and film entry and withdrawal slots on one side of said housing through which such a film unit may be respectively inserted into and withdrawn from said lighttight chamber;

processing means in said lighttight chamber for effecting the distribution of the fluid between the predetermined layers of such a film unit inserted, leading end first, into said lighttight chamber through said film entry slot and for advancing the film unit within said lighttight chamber; and

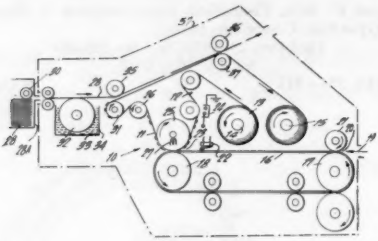
guide means for guiding the film unit as it is advanced within said lighttight chamber from said processing means to said withdrawal slot, said guide means including a curved member defining a curved path of travel for the film unit of a predetermined length, said predetermined length being at least equal to the length of the film unit but less than the combined length of the film unit and the film unit tab extending forwardly of the leading end of the film unit, to cause at least a portion of the film unit tab to extend through said withdrawal slot, while the photosensitive and image-receiving layers of the film unit remain in the lighttight environment of said chamber, to give the user a visual signal that the fluid has been completely distributed and an imbibition period following distribution has started,

wherein said guide means supports such a film unit in the lighttight environment of said chamber during the imbibition period.

3,854,813
ELECTROSTATIC PRINTING APPARATUS USING CHARGE INDUCED TONING

Arthur L. Kaufman, 26 High Point Rd., Westport, Conn. 06880

Continuation of Ser. No. 221,646, Jan. 28, 1972,. This application Sept. 10, 1973, Ser. No. 395,525
Int. Cl. G03g *9/04, 13/10*
U.S. Cl. 355—10 **16 Claims**

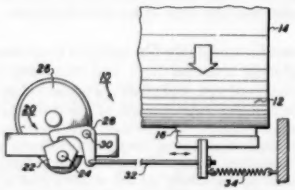


1. An electrostatic printing apparatus comprising a housing, a latent charge image receiving member within said housing, means to create a latent charge image upon the latent charge image receiving member, a source of sheet-like record material, a source of liquid toner, means to (wet) apply a thin film of said toner to at least one major surface of the record material (with the liquid toner), feed means to bring the latent image bearing member and record member together in an initially gapped relationship with one wetted surfaced of the record member facing a surface of the latent image bearing member, means to transport the said wetted record member and latent image bearing member synchronously and along a converging path with the liquid toner on the record member in contact with the surface of the latent image bearing member until an image is induced in the record member and a visible image is formed upon the record member by the said toner and means adjacent the end of said converging path for separating the toned record member from the latent image bearing member.

3,854,814
TRANSLATING DWELL CLEANING SYSTEM

Robert N. Jones, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 24, 1973, Ser. No. 391,195
Int. Cl. G03g *15/00*
U.S. Cl. 355—15 **2 Claims**



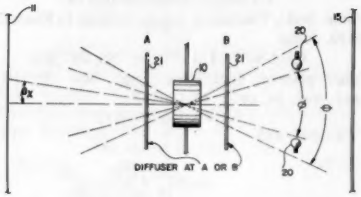
1. An electrostatographic imaging surface blade cleaning system in which a cleaning blade is cyclically oscillated laterally of the normal direction of motion of the imaging surface between two substantially spaced apart translation end dwell positions of said blade on said imaging surface, wherein the improvement comprises a blade drive means for cyclic lateral oscillation of said cleaning blade and for automatically multiply slightly shifting the positions on said imaging surface of said two blade translation end dwell positions without stopping the blade motion between said two translation end dwell positions,

wherein said blade drive means comprises a multi-lobe cam rotatably driven about an axis of rotation and a cam follower driven by said multi-lobe cam, said cam follower being drivingly connected to said blade for cyclic translation of said blade by said cam, and wherein said multi-lobe cam has a plurality of cam lobes having different maximum and minimum radii of revolution about said axis for said automatic shifting of said two blade translation end dwell positions at each said cyclic translation of said blade by said cam.

3,854,815
GRAPHIC ARTS CAMERA FLASHING ATTACHMENTS

Walter L. McIntosh, Woodbridge, Va., assignor to Log Etronics Inc., Springfield, Va.

Filed Nov. 9, 1973, Ser. No. 414,478
Int. Cl. G03b *27/54*
U.S. Cl. 355—67 **10 Claims**

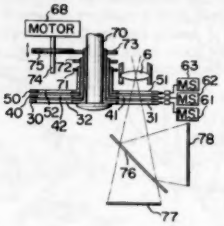


1. A flashing attachment for a Graphic Arts process camera of the type comprising a lens structure the optical axis of which is at right angles to a film plane structure disposed on one side of said lens structure and at right angles to a copyboard structure disposed on the other side of said lens structure, said attachment comprising a flashing light source located within the light acceptance angle of said lens structure and outside the image acceptance angle of said lens structure for selectively projecting flashing light toward said film plane structure, and translucent light diffusing material disposed between said flashing light source and said film plane structure for controlling the intensity of flashing light incident on said film plane structure to produce illuminance of substantially uniform intensity throughout a predetermined area of a sheet of photosensitive material supported by said film plane structure, said diffusing material comprising a non-Lambertian radiator the diffusion characteristics of which, when using a measuring light beam having a divergence of substantially 2° and incident perpendicular to the diffusing material, are defined by a polar curve of light intensity versus viewing angle exhibiting a light intensity 10° off-axis not more than 82 percent and not less than 60 percent of the intensity on-axis, exhibiting a light intensity 20° off-axis not more than 53 percent and not less than 26 percent of the intensity on-axis, exhibiting an intensity 30° off-axis not more than 36 percent and not less than 14 percent of the intensity on-axis, exhibiting an intensity 40° off-axis not more than 26 percent and not less than 9 percent the intensity on-axis, and exhibiting an intensity 50° off-axis not more than 18.5 percent and not less than 7 percent the intensity on-axis.

3,854,816
PHOTOGRAPHIC PRINTING APPARATUS

Ikuo Fujimura, Minamiashigara-machi, Japan, assignor to Fuji Shashin Film Kabushiki, Minamiaskigara-machi, Ashigarakami-gun, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 128,487, March 26, 1971, , which is a division of Ser. No. 887,281, Dec. 22, 1969, , which is a continuation-in-part of Ser. No. 446,032, April 6, 1965,.
This application Jan. 29, 1973, Ser. No. 327,398
Int. Cl. G03b *27/76*
U.S. Cl. 355—71 **8 Claims**

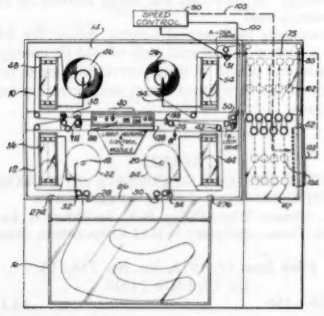


1. An apparatus for producing a photographic image and for producing the desired gradation from one kind of printing paper comprising a high intensity light source capable of producing a latent image on sensitized printing paper by an exposure of 0.01 second to 1 second, an electric power source for adjusting and effective light-up time of the light source connected thereto, means for varying the intensity of the light, in inverse proportion to the exposure time, at least one shutter for varying the exposure time between 1 second and 0.01 second and means for controlling the intensity of the light to adjust the density of the image produced and for varying the exposure time inversely proportionally to the light intensity, a lens and a light sensitive material containing silver halide.

3,854,817
APPARATUS FOR CONTINUOUS CONTACT DUPLICATION

Roger A. Erech, 1980 Meadow View Ct., Thousand Oaks, Calif. 91360; Charles H. Dietz, 18833 Killoch Way, Northridge, Calif. 91324, and Markvard Hauerbach, 19649 Green Mountain Dr., Newhall, Calif. 91321

Division of Ser. No. 170,186, Aug. 9, 1971, abandoned. This application Oct. 30, 1972, Ser. No. 302,383
Int. Cl. G03b *27/10*
U.S. Cl. 355—84 **1 Claim**



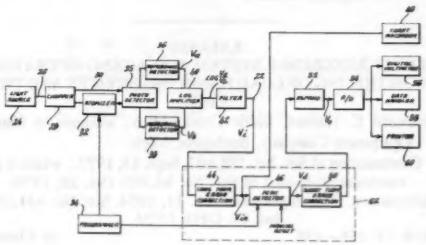
1. In apparatus for contact duplicating information carried by a continuously moving master strip onto a continuously moving light sensitive duplicate strip, comprising an exposure zone and means for moving said master and duplicate strips in close contact through said exposure zone, the provision of:

a lamp assembly in said exposure zone for exposing said master and duplicate strips, said lamp assembly comprising a lamp and reflector for said lamp, said reflector having a substantially greater length dimension than width dimension, and means for securing said reflector with its length dimension along the line of travel of said strips thereat, to define a beam of light of first width in said line of travel, and for rotating said reflector and securing said reflector with its width dimension along said line of travel to define a beam of light of second width in said line of travel.

3,854,818
SIGNAL PEAK DETECTION ARRANGMENT FOR ATOMIC ABSORPTION SPECTROMETRY

Walter Bohler, Norwalk, and Duane L. Smith, Fairfield, both of Conn., assignors to The Perkin Elmer Corporation, Norwalk, Conn.

Filed Mar. 2, 1973, Ser. No. 337,566
Int. Cl. G01j *3/42*
U.S. Cl. 356—85 **8 Claims**



1. An atomic absorption spectrometer, said spectrometer providing an output information signal representative of the absorbance of a sample material under test, said information signal accompanied by repeatable, relatively short-term, substantially constant amplitude error signal components which cause a deviation of said information signal from a desired reference level, an electrical signal amplitude peak detecting means, means for applying said signal representative of the absorbance of said sample material to said peak detecting means, a signal combining circuit means, means for applying an output signal from said peak detecting means to said signal combining circuit means, a storage circuit means for storing the magnitude of an electrical signal applied thereto, means coupling said storage means to said signal combining means for combining a phase-opposed stored signal with an output signal from said peak detector, and, means for selectively coupling an output from said signal combining circuit to said storage means.

3,854,819
LASER GYROSCOPE

Keimpe Andringa, 8 Course Brook Rd., Sherborn, Mass. 01770

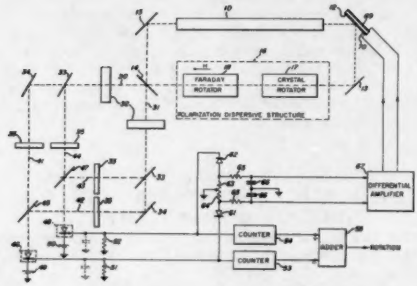
Continuation-in-part of Ser. No. 120,581, March 3, 1971, Pat. No. 3,741,657. This application Oct. 2, 1972, Ser. No. 294,394
Int. Cl. G01b *9/02*
U.S. Cl. 356—106 LR **19 Claims**

1. In combination:

means for simultaneously directing a plurality of radiant energy waves having at least a plurality of substantially coherent frequencies in opposite directions through a polarization dispersive medium;

means comprising a medium common to at least a portion of the path of each of said waves for amplifying said waves;

frequency responsive reflecting filter means in said path; and



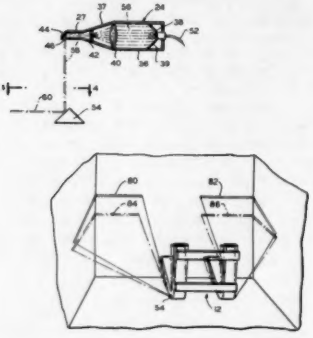
means for varying said frequencies comprising means for moving said medium.

3,854,820

LIGHT REFERENCE SYSTEM FOR AIDING OPERATOR POSITIONING OF LOAD HANDLING DEVICES AND THE LIKE

Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation of Ser. No. 288,607, Sept. 13, 1972, , which is a continuation-in-part of Ser. No. 84,703, Oct. 28, 1970, abandoned. This application Feb. 11, 1974, Ser. No. 441,683
Int. Cl. G01b *11/26*
U.S. Cl. 356—138 **31 Claims**



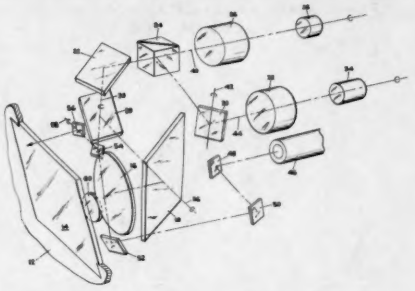
1. In a vehicle having a manipulatable load handling device, a light optical means mounted on the handling device being so constructed and arranged as to provide a substantially collimated light beam and to project said light beam from said load handling device as a diverging plane of light collimated in one dimension and in a predetermined attitude in relation to the load handling device such that a visual reference of the position of the load handling device appears in the form of a distinctly perceivable line of light on surfaces in the path of the projected diverging plane of light.

3,854,821

OPTICAL SYSTEM FOR WIDE BAND LIGHT ENERGY

John W. Thompson, Timonium, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1971, Ser. No. 193,944
Int. Cl. G01j *1/20*
U.S. Cl. 356—152 **2 Claims**



1. An optical system for tracking a target from an airborne platform, said optical system comprising:

a positive refractive element positioned within an aircraft for receiving a beam of spectral energy containing visual and IR wave lengths from said target, said refractive element having characteristics permitting passage of visual and IR spectral energy, said refractive element forming an image plane for said visual energy a first optical distance from said refractive element, and forming an image plane for said visual energy a second optical distance from said refractive element;

means mounting said refractive element for movement about an elevation axis and an azimuth axis for tracking said target;

means for splitting said refracted beam of spectral energy into a band containing said visual energy and a band containing substantially said IR light energy;

a first sensing means positioned in the path of said visual energy band for detecting the image formed by visual energy;

means mounting said first sensing means for rotation about a central axis of said path of said visual energy band for derotation of said visual image corresponding to rotation of said refractive element about said elevation and azimuth axes;

a second sensing means positioned in the path of said IR light energy for detecting the image formed by said IR light energy; and

means mounting said second sensing means for rotation about a central axis of said path of said IR energy band for derotation of said IR image corresponding to rotation of said refractive element about said elevation and azimuth axes.

3,854,822

ELECTRO-OPTICAL SCANNING SYSTEM FOR DIMENSIONAL GAUGING OF PARTS

Norman G. Altman, White Plains, N.Y., and Marc G. Dreyfus, Stamford, Conn., assignors to BAI Corporation, Stamford, Conn.

Filed June 27, 1973, Ser. No. 374,113
Int. Cl. G01b *11/00*
U.S. Cl. 356—156 **14 Claims**

1. An electro-optical scanning system for gauging the dimensions of a machined part and other fabricated objects and assemblies to determine whether the part meets predetermined manufacturing standards, said system comprising:

A. an electro-optical scanner having a light sensitive face;

B. optical means including a fixed high intensity light

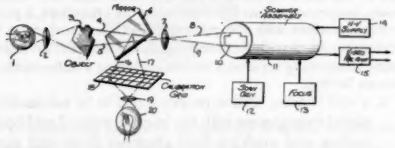
source illuminating a part to be measured to project an outline of said part to be measured onto said face;

C. a scan generator operatively coupled to said scanner to produce scan voltages generating a scan whose position and length are controllable to define a scan path which traverses those edges of the image of the part outline that constitute the terminal points of a dimension to be measured, whereby the scanner yields a video signal representing said dimension;

D. an electronic clock generating periodic pulses at a constant rate;

E. means to apply said video signal to said clock to gate the operation thereof to produce a train of pulses in the time interval between said terminal points;

F. a counter coupled to said gated clock to count the number of pulses in said train to produce a test count representing said time interval;



G. a reference-value storage register;

H. an input information matrix coupled to said controllable scan generator and to said register to supply, in regard to each of the several part dimensions to be measured, information to said scan generator for producing a scan along a scan path appropriate to each part dimension and to supply to said register information regarding the counts appropriate to the nominal dimensions of each part dimension; and

I. means comparing the test count yielded by the counter for each measuring scan with the reference count in said register representing the related nominal dimension, to produce an output signal indicative of the disparity between the part dimension measured and the nominal dimension.

3,854,823

MEASURING AND COUNTING SYSTEMS

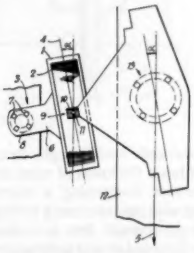
John Loxham, Bletchley, England, assignor to Cranfield Institute of Technology, Cranfield, Bedfordshire, England

Filed Mar. 3, 1972, Ser. No. 231,674

Claims priority, application Great Britain, Mar. 5, 1971, 6194/71

Int. Cl. G01b *11/04*

U.S. Cl. 356—169 **9 Claims**



1. A mechanism having two relatively movable parts and a digital displacement sensing device for detecting the relative linear motion of the two parts of the mechanism, the device including: a first member which comprises a linear scale carried by one of said parts and having a plurality of digital indicators; a second member which comprises a scale reading element mounted on the other of said two parts so that said scale reading head can traverse relative to the linear scale; and means for selectively adjusting the angle between the length direction of said linear scale and the intended direction of the relative motion of said two parts of a mechanism, whereby the extent of the relative motion in said direction and corresponding to the distance between two of said digital indicators of said scale can be adjusted finely.

3,854,824

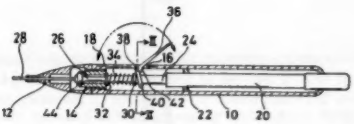
MECHANICAL PENCIL

Mitsunori Kamo, Hiroshima, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1973, Ser. No. 347,384

Int. Cl. B43k *21/22*

U.S. Cl. 401—65 **4 Claims**



1. A lead storage pencil comprising an outer body casing formed at its side portion with an opening and an aligned recess contiguous to said opening, said casing terminating in a threaded end portion, a threaded, axially apertured, element threadedly engaging said threaded end portion of said casing and having a length to provide a threaded section extending beyond said end of the casing, said threaded element having an end face adjacent said recess, intermediate tube means coaxially disposed within and fixed to said outer body casing, a lead tube coaxially disposed relative to said casing and to said tube means for sliding movement relative to the latter and within and through the aperture in said element and being integrally formed at the projecting end thereof with lead chucking means for selectively chucking or releasing lead from the lead tube and with first and second flange means, one of which is in the region of said opening in the body casing for providing an abutment surface, said lead tube being slidably supported by said intermediate tube means, spring means mounted between said abutment surface of said one of said flange means and the other of said flange means for normally urging the lead tube in a first direction, said other of said flange means normally engaging said end face of said element, force translating means for translating a radially applied manual force to an axially directed force and comprising a manually operable lever and a ring formation each being pivoted to a common pivot traversing said opening in the side portion of the casing, said ring formation, on depression of said lever, acting on said one of said flange means to urge the lead tube in a second direction opposite to said first direction against the bias of said spring, said lever when a writing operation is terminated being movable for positioning within said recess on movement of said lever in a direction opposite to its direction of depression for moving said lead in said second direction, and a cap nozzle threadedly engaging said threaded extension of said element and provided with an end opening through which an end of lead is projectable on release of the lead by the chucking means on depression of said lever against said bias of said spring.

3,854,825
REFILLABLE PENCIL

Albert Girella, Geneva, Switzerland, assignor to Fabrique Suisse De Crayons Caran D'Ache S.A., Geneva, Switzerland

Filed Apr. 3, 1973, Ser. No. 347,472
Claims priority, application Switzerland, Oct. 3, 1972, 14402/72
Int. Cl. B43k 21/16
U.S. Cl. 401—94 2 Claims

1. A mechanical lead pencil comprising a hollow body including a bored lead receiving end, return spring within said body, a sliding tubular lead holding member within said body and having a portion thereof surrounded by said spring, said body and said lead holding member both made of plastic material possessing limited resilience, said lead holding member including at one end a plurality of clamping tongues to clamp the lead and at the opposite end a pushbutton projecting out of the end of said body opposite said lead receiving end to permit the user to move the sliding lead holding member against the action of said return spring, a wedge shaped annular member disposed between said tongues and the inner wall of said hollow body, first and second stop means above and below said annular member, the engagement of said annular member with said second stop means ensuring the clamping of said tongues and simultaneously locking said lead holding member against the action of said spring, the engagement of said annular member with said first stop means ensuring the release of said tongues, braking tongues in said hollow body exerting friction against said lead, the inner wall of said hollow body provided with an annular rib, the outer wall of said sliding lead holding member also provided with an annular rib so as to keep said sliding member in place against the action of said spring in the absence of a lead in said pencil, said lead holding member being integral with said clamping tongues, said push button also integral with said lead holding member, said lead holding member being of reduced outer diameter near said clamping tongues and including a shoulder separating the reduced diameter portion from the larger portion, said spring having one of its ends abutting said shoulder, the opposite end of said spring abutting said second stop means, whereby, when lead is removed from said sliding member said sliding member and spring may be withdrawn completely from said body by axially pulling said push-button away from said body to force said sliding member rib to pass said body rib.

3,854,826
FLUID APPLICATOR PRESSURE CONTROL DEVICE

Patrick J. Adams, Bellefontaine, Ohio, assignor to Artex Hobby Products, Inc., Lima, Ohio

Filed Dec. 26, 1973, Ser. No. 427,660
Int. Cl. B43k 5/02, 7/10
U.S. Cl. 401—188 7 Claims

1. In a fluid applicator having a hollow elongated body, a marking fluid chamber within the body for containing a quantity of the marking fluid, a pumped fluid chamber within the body, separator means for separating the chambers, a pump in communication with the pumped fluid chamber and a tip in communication with the marking fluid chamber, an improvement comprising separator means including a deformable plug means having:

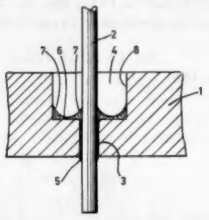
a. a wall bearing section proportioned to be substantially in sealed engagement with the interior walls of said body for sealing said marking fluid chamber from said pumped fluid chamber;

b. a pressure transfer section connected to and movable relative to said wall bearing section for transferring pressures to and from fluids in said fluid chambers, the wall bearing and pressure transfer sections being formed so that changes in pressure cause said pressure transfer section to move prior to movement of said wall bearing section in response to pressure changes.

3,854,827
METAL-TO-CERAMIC LEADTHROUGH

Josef Merz, Hamburg, Germany; Johannes Van Esdonk, and Joannes Franciscus Maria Janssen, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1972, Ser. No. 308,685
Claims priority, application Germany, Dec. 1, 1971, 2159531
Int. Cl. F16b 11/00; C03c 27/02
U.S. Cl. 403—29 2 Claims



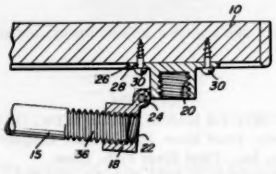
1. A metal-to-ceramic leadthrough, comprising: a ceramic wall portion that has a thickness of more than 2 mm and that includes an aperture comprising a narrow portion which changes in a step-wise manner into a wider portion, said narrow portion having a length that is at most about 2 mm; a metal conductor disposed in said aperture and spaced by a gap from the aperture wall; and a body of glass-like material disposed at and entirely filling the gap between the conductor and the inner wall of the narrow portion of the aperture, said body forming a relatively thin layer on the bottom of the wide portion of the aperture and said thin layer forming a meniscus both against the conductor and against the inner wall of the

wide portion of the aperture, said conductor consisting of a material having a coefficient of thermal expansion which is lower than that of the ceramic portion.

3,854,828
THREADED MOUNTING SLEEVE WITH RELATIVELY PIVOTABLE END SECTIONS

John P. Jones, 900 Saturn Dr., Apt. 304, Colorado Springs, Colo. 80906

Filed Mar. 21, 1973, Ser. No. 343,483
Int. Cl. F16l *27/0*
U.S. Cl. 403—100 **6 Claims**

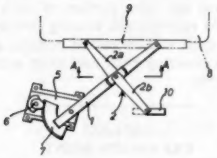


1. A connecting assembly comprising first and second sections pivotally supported from each other for relative angular displacement about a predetermined pivot axis between first and second relative positions, said sections defining coaxial threaded bores when said sections are in said first position with said axis extending transversely and disposed to one side of said bores closely adjacent the adjacent ends thereof, the bore in one of said sections comprising a through bore, and a threaded elongated member removably threadedly engageable through said through bore and into the bore in the other section when said sections are in said first positions, the other of said sections including abutment means engageable by the terminal end of said threaded member limiting threaded penetration of said threaded member into the bore in said other section.

3,854,829
JOURNALLING JOINT FOR CONNECTING ARMS TO EACH OTHER

Ryuzo Nakano, Aichi, and Takeo Yamazaki, Anjo, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Apr. 6, 1973, Ser. No. 348,699
Claims priority, application Japan, Apr. 7, 1972, 47-41519[U]
Int. Cl. F16c *11/00;* **F16d** *27/00*
U.S. Cl. 403—162 **7 Claims**

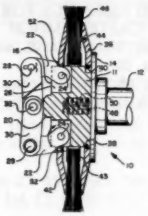


1. A journalling joint for use in raising and lowering a vehicle door window, or the like, comprising first and second arms, a circular through-hole provided in said first arm, a metal disc rotatably seated in said through-hole, said disc having opposed faces substantially parallel with the respective face portions of the first arm which surround the through-hole, said second arm being formed of two sections, each of said sections having a base end and an outer end, and the base ends of said sections of said second arm being welded to the opposed faces of said disc, whereby said two arms are pivoted to one another for relative rotational movement.

3,854,830
QUICK-RELEASE MECHANISM FOR CLAMPING A TOOL ON A HUB

Walter Vornberger, Tewksbury, Mass., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Nov. 12, 1973, Ser. No. 415,089
Int. Cl. F16d *1/06*
U.S. Cl. 403—252 **4 Claims**

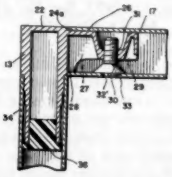


1. A quick-release mechanism for clamping a tool on a hub comprising: a back flange mounted to the hub; a front flange removably mounted to the hub for forward-rearward movement on the hub and located forwardly on the back flange; a first finger pivoted to the hub for inward-outward swinging movement about a first axis and extending away from said first axis and said front flange; a second finger pivoted to the hub for inward-outward swinging movement about a second axis and extending away from said second axis and said front flange; a detent on each of said fingers bearing against the front of the front flange; a first toggle arm pivoted to the front of the first finger for swinging movement about a third axis and extending inwardly of the first finger and forwardly of the hub; a second toggle arm pivoted to the front of the second finger for swinging movement about a fourth axis and extending inwardly of the second finger and forwardly of the hub; and means pivoting the inner ends of the toggle arms to each other for swinging movement about a fifth axis; whereby the tool may be located on the hub between the back and front flanges and clamped between the flanges when the fifth axis is rearward of the straight line extending between the third and fourth axes pursuant to a yieldable forward force applied against the front flange which causes the inner ends of the toggle arms to bear against the front of the hub.

3,854,831
CORNER CONNECTOR FOR TUBULAR MEMBERS

Kenneth H. Gutner, 3285 Dato, Highland Park, Ill. 60035

Filed Aug. 31, 1970, Ser. No. 68,403
Int. Cl. F16b *7/04*
U.S. Cl. 403—292 **4 Claims**



1. In combination, a fitting for interconnecting tubular members of generally square cross-section, comprising a unitary body having at least two integral projections extending away therefrom and adapted to be ensleeved within a tubular

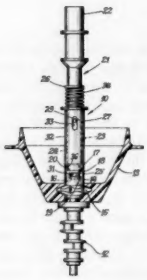
member, at least one projection being an arm having, at its root, cross-sectional dimensions sized to snugly fit said arm to its associated tubular member, the height dimension of said one arm being reduced adjacent the end of said arm, said arm being equipped with a tapped bore for receiving a bolt to fix said associated tubular member relative to a given arm, a bolt and tubular member, said bolt having a raised head portion operative upon withdrawal to engage an opening in said tubular member to cinch said tubular member in place on said fitting.

3,854,832

HANDLING ROD ASSEMBLY FOR INVESTMENT CASTING MOLD

Glenn Sherwin Cowper, Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 15, 1973, Ser. No. 323,937
Int. Cl. B25g *3/28;* **B22c** *7/00*
U.S. Cl. 403—349 **7 Claims**



1. An investment casting handling rod assembly adapted for use in making an investment casting mold comprising

a rod having attachment means on its upper end adapted to attach the rod assembly to mold handling apparatus,

a casting connecting lug having an irregularly shaped head, coupling means detachably connecting said lug to a lower end of said rod assembly and for preventing axial movement of said lug relative to said rod, and

anti-rotation means for preventing both clockwise and counter-clockwise rotation of said lug relative to said rod.

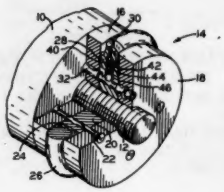
3,854,833

EXPANDABLE RING CONNECTING DEVICE

David Samiran, 148 Northwest Rd., and Arthur H. Moore, 46 Northwest Rd., both of Westfield, Mass. 01085

Filed Dec. 11, 1973, Ser. No. 423,738
Int. Cl. F16b *7/04*
U.S. Cl. 403—377 **14 Claims**

1. In combination; a cylindrical member, a radially outwardly opening annular groove in said member, at least one split ring of stiff wire in said groove having the ends thereof in opposed relation, radial plunger means in said member having a radially outer end portion disposed between and in engagement with the opposed ends of said wire ring, said radially outer end portion of said plunger means tapering inwardly in the radially outer direction, and actuating means moveably carried by said member and operatively engaging the radially inner end of said plunger means and adjustable for moving said plunger means radially outwardly in said member to cause said radially outer end of said plunger means to force said ends of said wire ring away from each other and thereby expand the diameter of said wire ring, said wire ring protruding radially



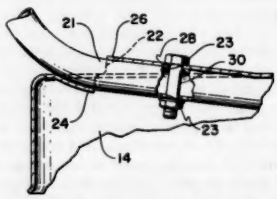
outwardly from said groove in at least the expanded condition thereof.

3,854,834

LAWN MOWER HANDLE MOUNTING DEVICE

Joseph J. Lane, Thief River Falls, Minn., assignor to Arctic Enterprises, Inc., Thief River Falls, Minn.

Filed Oct. 9, 1973, Ser. No. 404,391
Int. Cl. F16b *7/00*
U.S. Cl. 403—386 **4 Claims**



1. In a powerized lawn mower assembly, improved structure for securing a substantially upright handle assembly to said lawn mower assembly, improvement comprising, in combination, a pair of elongated substantially upright arms defined on said handle assembly and having frontwardly directed, unitary lower end portions, each of said end portions having a front section and a rear section, a top deck for said lawn mower assembly, a pair of laterally spaced means deformed from said deck for receiving each of said end portions, said receiving means each including a forward portion elevated above the plane of said deck and having a linear axis and a rear portion depressed below the plane of said deck and having a curved axis, a rearwardly facing opening at the juncture between each of said elevated and depressed portions, each said opening receiving each said end portion, each said front section bearing directly against the inner surface of each said elevated portion, each said rear section bearing directly against the outer surface of each said depressed portion, and a fastener for rigidly interconnecting each said front section and each said elevated portion.

3,854,835

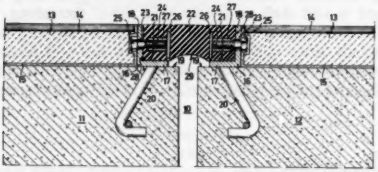
EXPANSION JOINT

Wilhelm Stog, Waltrop, Germany, assignor to W. Stog KG Industrie-und Rohrleitungsbau, Waltrop, Germany

Filed May 4, 1972, Ser. No. 250,329
Claims priority, application Germany, Nov. 9, 1971, 2155651
Int. Cl. E01c *11/12*
U.S. Cl. 404—68 **8 Claims**

1. An expansion joint for adjacent roadway sections having a gap therebetween to allow expansion of said sections, said sections being recessed along their adjacent edges to form a groove along both sides of said gap, said joint comprising in

combination a plate structure fixed to each section along the bottom of said groove, each of said plate structures having a support projection parallel to and spaced from said gap, said recessed sections supporting an expansion member extending into said grooves, said expansion member consisting of a joint strip of elastic material having free side surfaces, retaining ribs inset in said strip, said ribs each comprising a series of individual sections running in the longitudinal direction of the strip and each of individual sections being provided with at least one threaded bush, said bush having an axis arranged trans-



versely to the expansion gap, said bushes each engaging with a tensioning bolt which bears freely and rotatably against a corresponding support projection in said groove, said plate structures having a support projection being fixed in the recessed sections comprising inlaid angle-irons having the horizontal flanges thereof mounted on the floor of the recess, adjacent the expansion gap, and vertical flanges of angle-irons having holes for the tensioning bolts to pass through, said retaining ribs being arranged to be divergent towards the floor of the recess in relation to the vertical flanges of the angle-iron.

3,854,836

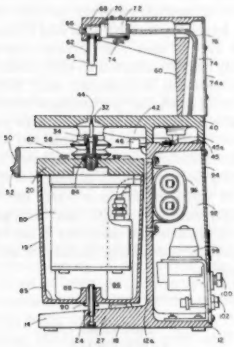
DRILLING MACHINE FOR PLASTER CASTS OR MODELS

Bernard Weissman, 236 Fifth Ave., New York, N.Y. 10001

Filed Jan. 2, 1973, Ser. No. 320,275

Int. Cl. B23b *41/00, 47/22*

U.S. Cl. 408—14 **13 Claims**



1. A drilling machine for drilling holes in a plaster cast comprising a frame having a stationary horizontal drilling platform, said drilling platform having an opening therethrough and a top surface adapted to support a cast which is positionable over said opening; drilling means mounted on said frame and positioned below said drilling platform and vertically movable between two spaced vertical positions, said drilling means being adapted to receive and support a drill bit, said drill means being arranged to maintain the drill bit below said top surface in one of said positions while passing the drill bit through said opening and above said top surface in the other of said spaced positions to thereby drill a hole in the plaster cast positioned on said top surface covering said opening; and actuating means for moving said drilling means from one of said positions to the other of said positions, said actuating means comprising a handle pivotally connected to said frame and engageable with said drilling means, said handle extending adjacent to and substantially along the length of the periphery of said drilling platform, whereby both said handle and the plaster cast to be drilled can be simultaneously manually gripped with both hands and said drilling means can be moved by moving said handle while securing the position of the plaster cast during drilling of the latter.

3,854,837

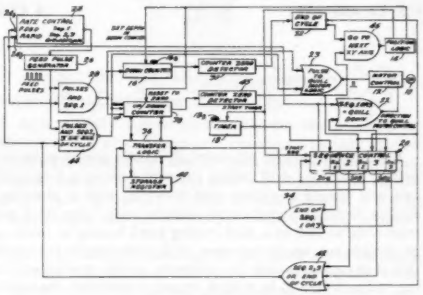
APPARATUS AND MEANS FOR PERFORMING A METHOD FOR CONTROLLED DEEP HOLE DRILLING

Marvin L. Kreithen, Huntington Valley, and John J. Lawler, Newportville, both of Pa., assignors to Textron Inc., Providence, R.I.

Filed Feb. 23, 1973, Ser. No. 335,075

Int. Cl. B23b *47/18*

U.S. Cl. 408—17 **18 Claims**



1. The means for performing a method of drilling deep holes using a step motor drive quill comprising

a pulse rate control for supplying pulses to the step motor providing at least two pulse rates, a slower rate for drilling and a faster rate for advance to work, withdrawal and reinsertions of the drill,

a direction control controlling the direction of rotation of the step motor,

a sequence control in which a predetermined pattern of drilling a hole is established and which at appropriate times acts upon the direction control and the pulse rate control to change direction and change pulse rates, respectively, and

position control consisting of at least two counters responding to pulses from the step motor and including

a down counter counting cumulatively actual hole depth achieved from pulses at the slow rate,

an up/down counter counting pulses down as positive and pulses up as negative and being capable of modification in accordance with program from the sequence control whereby

the sequence control determines the order in which action occurs,

the step motor advances the quill a predetermined amount into the work from a starting point at said slower rate appropriate for drilling into the work,

both counters accumulate a count of pulses used to drive said step motor representative of the hole depth drilled until a predetermined depth is reached,

the sequence control reverses direction and speed of the step motor for withdrawing the quill away from the work, the up/down counter counts pulses driving the motor to

the starting point at the more rapid rate a distance represented by said accumulated count,

at the start point the sequence control reverses motor direction for returning the quill at said more rapid rate to the point of furtherest drilling advance as represented by said accumulated count,

at the furtherest drilling advance the sequence control changes speed for advancing the quill at said drilling rate adding to the accumulated count in the counters as drilling proceeds until either a predetermined depth or the full desired depth of the hole is reached,

the sequence is repeated adding a predetermined drilling depth each cycle until full hole depth is achieved, and

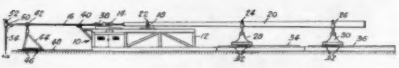
when the full desired depth is reached by comparison with the down counter the quill is withdrawn to the starting point.

3,854,838

POLE CORER

George J. Barnett, La Prairie, Quebec; Mark Stanoy, Montreal, Quebec, and Robert L. Watson, St. Leonard, Quebec, all of Canada, assignors to Domtar Limited, Montreal, Canada

Filed Dec. 5, 1972, Ser. No. 312,364
Int. Cl. B23b *41/02*
U.S. Cl. 408—59 **6 Claims**



1. An apparatus for substantially axially coring poles comprising a tubular drill casing extending along a longitudinal axis and having a cutting end provided with a plurality of cutting teeth arranged in an annular ring lying in a plane transverse to said axis, said cutting teeth having an inside and an outside set, spaces between said teeth, means for rotating said drill casing, means for relatively axially moving said casing and said pole to be drilled, means to correlate the rotation of said drill with the relative axial movement between said drill and said pole thereby to form in said pole a core surrounded by an annular hole while producing wood particles having at least one dimension less than a preset length, means for introducing air under pressure into said tubular casing and forcing said air to pass between said core and the inside of said casing through said spaces between said teeth and back between the outside of said casing and the surface of said annular hole, said spaces between said teeth being of sufficient size to receive a plurality of said wood particles and permit same to be contacted by said air and delivered out of said annular hole in the clearance space formed by said outside set between the outer periphery of said casing and the outer periphery of said annular hole, guiding surfaces projecting radially from said casing a distance substantially equal to said outside set and extending substantially helically around said casing, some of said guiding surfaces trailing in a spiral path one from each of said teeth and further of said guiding surfaces positioned at spaced locations along said casing.

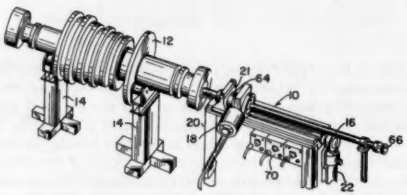
3,854,839

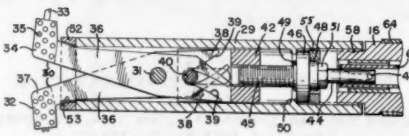
BOTTLE BORING TOOL

Herbert R. Gottelt, Mount Prospect, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Mar. 2, 1973, Ser. No. 337,671
Int. Cl. B23b *27/00, 3/26*
U.S. Cl. 408—129 **20 Claims**

1. A boring head particularly adapted for use in a boring assembly to enlarge the diameter of an existing bore within a turbine shaft or the like along a desired linear portion of the shaft, including shell means having a central axis and formed to allow its insertion within the existing bore of the shaft, said shell means being rotatable about said central axis within said bore, at least one cutting tool means mounted within said shell means and rotatable therewith about said central axis, said tool means being mounted within said shell means for pivoting movement relative thereto, said tool means having a cutting portion extensible linearly beyond a forward end of said shell means and being movable radially with respect to the central axis of said shell means, cam assembly means mounted within said shell means, said cam assembly means including a cam means disposed transversely to the central axis of said shell means and along a diametrical axis thereof, said cam means being mounted between opposite, axially extending slots formed in said shell means for axial travel therealong, said cam means engaging a cam follower portion of said tool means to radially move said cutting portion of said tool means by pivoting said tool means in response to the axial movement of said cam means along said central axis of said shell means, said





cam assembly means also including a yoke member to transmit such axial movement to said cam means, said yoke member having a forked portion mounted on said cam means and a body portion integrally formed with said forked portion and disposed at an end of said yoke means opposite said cam means, said body portion adapted to threadedly engage transmission means mounted in stationary axial position with respect to said boring head, said transmission means being rotatable about a central axis thereof to move said yoke means and thereby said cam means to a precise, selected position relative to said shell means thereby providing selected radial positioning of said cutting portion of said cutting tool means to allow, upon rotation of said shell means and said cutting tool means and cam assembly means therewith, said boring head to cut an enlarged bore of pre-selected diameter in the turbine shaft to selectively eliminate undesirable inclusions and stress points within such shaft.

3,854,840

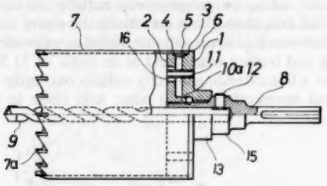
CORE DRILL

Masaaki Miyanaga, 5-15-109 Matsuhamacho, Ashiya, Japan

Filed Feb. 15, 1974, Ser. No. 442,903
Int. Cl. B23b *51/04*
U.S. Cl. 408—204 **3 Claims**

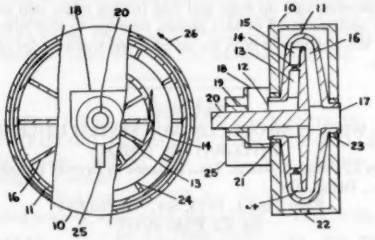
1. A core drill comprising a shank having a drill receiving recess in the lower end thereof, a shoulder thereon and a threaded portion between said shoulder and said lower end, a fixed disk around said shank between said shoulder and said threaded portion and against said shoulder, a movable disk threaded on said threaded portion, said disks having tapered edge portions on the peripheral edges thereof which taper

toward each other, a split ring having a cross-section with tapered edges engaging said tapered edge portions, and a



drilling cylinder around said ring with the inside surface of the drilling cylinder closely fitted to the outer surface of said ring.

3,854,841
TURBINE
Michael Eskeli, 7994-41 Locke Lee, Dallas, Tex. 77042
Filed Oct. 9, 1973, Ser. No. 404,406
Int. Cl. F01d *1/16, 5/08, 25/08*
U.S. Cl. 415—81 **6 Claims**



1. A turbine for generating power comprising:

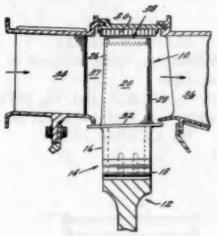
a. a casing for supporting a shaft;

b. a shaft journalled in bearings for rotation and supported by said casing;

c. a rotating rotor mounted on said shaft so as to rotate in unison therewith; said rotor having an entry port disposed near the center of said rotor for entry of a working fluid with said entry port communicating with radially outward extending passageways for passing said working fluid; said outward extending passageways having vanes therewithin for ensuring that said working fluid will rotate with said rotor for acceleration and for pressurizing said working fluid; said radially extending passageways being provided with nozzles at their outward ends for passing said working fluid with said nozzles being oriented to discharge said working fluid forward in the direction of rotation thus increasing the absolute tangential velocity of said working fluid to a value greater than the tangential velocity of said nozzles; said nozzles discharging said working fluid to a first peripheral cavity of said rotor; said working fluid being then passed from said first peripheral cavity to rotor inward extending passageways with said inward extending passageways being provided with vanes for assuring that said working fluid will rotate with said rotor and for generation of power associated with the deceleration of said working fluid; the outward ends of said vanes within said inward extending working fluid passageways being at radial distance greater from rotor center than the discharge ends of said nozzles; said inward extending passageways being connected with an exit port being disposed near the center of said rotor for discharge of said working fluid;

d. a fluid being flowed through said rotor; said fluid being flowed into said inlet of said rotor and being pressurized by centrifugal compression therewithin and discharged outwardly and substatially tangentially in said forward direction at a tangential velocity that is substantially higher than said tangential velocity of said nozzles; said fluid having high said tangential velocity because of the additive effects of the pressure velocity of the fluid under the differential pressure existing between the entry and exit ends of said nozzles plus the tangential velocity due to the tangential velocity of said nozzles.

3,854,842
ROTOR BLADE HAVING IMPROVED TIP CAP
Corbett D. Caudill, Franklin, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed Apr. 30, 1973, Ser. No. 355,313
Int. Cl. F04d *29/08;* **F01d** *5/00*
U.S. Cl. 415—116 **12 Claims**

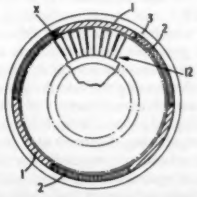


1. In a partially hollow turbomachinery blade having an upstream end, a downstream end and spaced radially extending sidewalls defining a partially open radially outward end, the blade used in cooperation with a circumscribing shroud disposed near the radial extremities of said sidewalls, a tip cap for cooperating with the open blade end, the tip cap comprising:

a generally axially extending closure plate for providing a partial seal between the blade interior and the blade environment, the closure plate recessed from the radial extremities of said sidewalls and defining therewith and with the shroud a tip space; and

a rib extending radially outwardly from the closure plate and generally axially from the upstream to the downstream end of said blade for partially dividing the tip space.

3,854,843
COMPOSITE ELONGATE MEMBER HAVING A PREDETERMINED EFFECTIVE COEFFICIENT OF LINEAR EXPANSION
Robert Noel Penny, 12 Alderbrook Rd., Solihull, England
Filed Nov. 27, 1972, Ser. No. 309,790
Claims priority, application Great Britain, Dec. 1, 1971, 55665/71
Int. Cl. F04d *19/00, 29/02*
U.S. Cl. 415—197 **6 Claims**



1. A stator shroud ring assembly in which a turbine of a gas turbine engine is to be positioned with an annular gap of

predetermined radial distance between the stator shroud ring and the periphery of the turbine rotor, the stator shroud ring assembly including a stator shroud ring constructed from at least one arcuate portion made of one material and at least one arcuate portion made of another material, the arcuate portions being assembled end-to-end and the co-efficients of linear expansion of the material employed and the total arcuate length employed of each material being such that the circumferential length of the whole shroud ring will change with temperature, within the range of working temperature for which the engine has been designed, by an amount corresponding to a predetermined effective co-efficient of linear expansion, whereby the total change in circumferential length of the stator shroud ring will substantially correspond to the alteration in diameter of the rotor, the radial dimension of said annular gap thereby being maintained at substantially the aforesaid predetermined value.

3,854,844

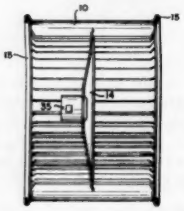
BLOWER WHEEL

James R. Ranz, Wilmington, Ohio, assignor to Philips Industries Inc., Dayton, Ohio

Division of Ser. No. 106,021, Jan. 13, 1971, Pat. No. 3,737,966. This application May 14, 1973, Ser. No. 359,905

Int. Cl. F04d *29/28*

U.S. Cl. 416—184 **2 Claims**



1. A direct drive bladed blower wheel comprising a pair of roll-formed sheet metal end rings formed of strip material, said end rings each having ends which are overlapped and welded to form a continuous ring, a series of generally axially aligned and peripherally spaced blades having ends supported on said end rings, a single sheet metal center drive disk received axially within said blades and having a series of peripheral tabs defining slots engaging and supporting each blade at a location axially spaced between said end rings, the gauge thickness of said drive disk being substantially greater than that of said end rings.

3,854,845

PROPELLER HAVING ANGULARLY DISPOSED TIP

Frank Van De Water, 28604 Covecrest Dr., Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 159,184, July 2, 1971, abandoned. This application May 7, 1973, Ser. No. 357,835

Int. Cl. B64c *11/18*

U.S. Cl. 416—228 **3 Claims**

1. A propeller which is to be power driven rotatively about a predetermined generally horizontal axis and in a predetermined direction to cause horizontal advancement of an airplane: said propeller having a blade projecting generally radially outwardly away from said axis and which has a leading edge, and a trailing edge, and a tip edge extending therebetween; said tip edge being disposed at a pitch angle with respect to a plane extending perpendicular to said axis of the propeller; said leading and trailing edges having outer portions at substantially their outermost ends which extend approximately radially with respect to said axis and which essentially meet opposite ends of said tip edge; said tip edge being so shaped that, as it advances generally circularly from said approximately radial outer portion of the leading edge to said approximately radial outer portion of said trailing edge, the tip edge also advances progressively radially outwardly away from said axis, throughout essentially the entire circular distance between said approximately radial outer portions of said leading and trailing edges, and at an angle of 71.5° with respect to a line extending directly radially outwardly from said axis and intersecting the tip edge; said blade in extending

between said tip edge and said trailing edge having an airfoil cross section in all planes perpendicular to a radial line and intersecting both the tip edge and trailing edge, which airfoil cross section is defined by a convexly curved forward face of the blade and a substantially flat rear face following a straight line between said tip edge and said trailing edge; said airfoil cross section, in all of said planes, tapering to thin substantially sharp shapes at both the tip edge and trailing edge of the blade.

3,854,846

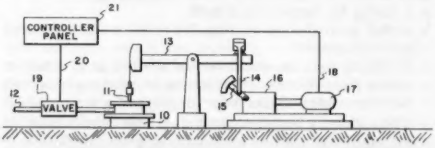
OIL WELL PUMPOFF CONTROL SYSTEM UTILIZING INTEGRATION TIMER

Bobby L. Douglas, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed June 1, 1973, Ser. No. 365,881

Int. Cl. F04b *49/00*

U.S. Cl. 417—12 **13 Claims**



1. A system for controlling the operation of a well pumping installation including a pump, a motor for operating said pump, and a pumped fluid flowpipe, comprising:

means responsive to the flow of fluid through said flowpipe;

signal means for generating signals indicative of said response;

means to determine whether said signals are occurring less than a predetermined percentage of time during a given time interval; and

means to terminate the pumping operation in the event of said lesser determination.

3,854,847

APPARATUS FOR DAMPING THE PRESSURE INCREASE OF HYDROSTATIC DRIVES

Karl Schlecht, Bernhausen Stuttgart, Germany, assignor to Pulzmeister Interholding GmbH, Zurich, Switzerland

Filed Feb. 20, 1973, Ser. No. 333,652

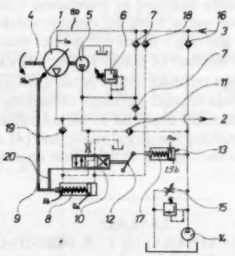
Claims priority, application Germany, Feb. 22, 1972, 2208172

Int. Cl. F04b *49/00*; **F15b** *15/18*

U.S. Cl. 417—212 **4 Claims**

1. An apparatus for damping the pressure increase of hydrostatic drives, especially axial piston pumps with swash plate control and pre-biased oil circulation system, the improve-

ment comprising an adjustment cylinder having a pressurized oil compartment, a pump, an oil infeed means including an oil infeed line for the pump, a check valve, the pressurized oil compartment of the adjustment cylinder being flow connected with the low pressure side of the oil infeed line of the pump via the check valve, said check valve opening in the direction



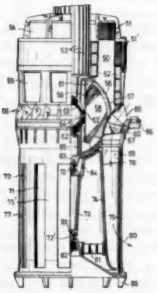
of the low pressure infeed line, an internal hydraulic servo-adjustment means, said adjustment cylinder defining an external adjustment cylinder, an internal adjustment cylinder, said servo-adjustment means incorporating an external adjustment lever hingedly connected with the external adjustment cylinder, and a further check valve for flow connecting the internal adjustment cylinder with the low pressure infeed line.

3,854,848

DEVICE FOR PREVENTING BACK-FLOW IN CENTRIFUGAL PUMPS OPERATING IN PARALLEL

Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen near Stuttgart, Germany

Filed Sept. 28, 1972, Ser. No. 293,141
Claims priority, application Austria, Oct. 7, 1971, 8658/71
Int. Cl. F04b *17/00*
U.S. Cl. 417—424 **4 Claims**



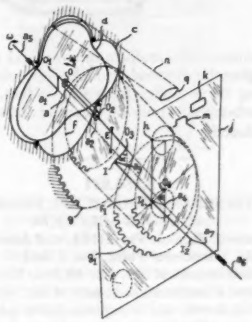
1. A flow responsive valve device for preventing back-flow of fluid through a centrifugal pump when the pump is not operating and when said pump creates a fluid swirl in a pump discharge area when the pump is operating, said valve device comprising a fixed valve member in the discharge area having apertures therein, a rotatable valve member in the discharge area having apertures therein adapted in a first rotatable position thereof to overlie the apertures in said fixed member to allow fluid flow through the apertures and in a second rotatable position thereof to be masked by the space between the apertures of said fixed member to prevent fluid flow through the apertures, spring means urging said rotatable valve member towards said second rotatable position, and blading on said rotatable member located in said discharge area adapted to be contacted by the fluid swirl when said pump is operating to urge said rotatable member to the first position against the force of the spring means such that the apertures of the first and second members overlie each other when the pump is operating.

3,854,849

DISTRIBUTION OF VALVE-GEAR SYSTEMS FOR ROTARY MACHINES

Maurice G. Brille, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France

Filed Feb. 1, 1973, Ser. No. 328,599
Claims priority, application France, Feb. 8, 1972, 72.04093
Int. Cl. F01c *1/02;* **F04c** *1/02, 17/02*
U.S. Cl. 418—61 B **10 Claims**



1. A rotary machine comprising:
a rotor with N lobes,
a pinion with KN teeth rigidly fixed on said rotor (K being a whole number),
a stator having N + 1 chambers,
a crown wheel with K (N + 1) teeth fixed on said stator,
a centrally disposed rotatable shaft coupled to said rotor by a first eccentric crank pin on which said rotor is rotatable, said rotor being driven in rotation by said pinion,
said pinion being concentric with an eccentric bearing and engaging said crown wheel,
said stator having the same axis as the rotatable shaft,
a distributor disc supported against a friction face of a side plate, said disc being rotatably mounted on a second eccentric crank pin on said rotatable shaft,
a toothed crown wheel rigidly fixed on said distributor disc and centered on the axis of said second pin, and
said disc crown wheel being driven by said pinion.

3,854,850

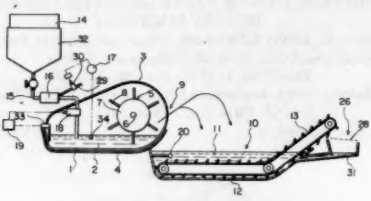
ROTARY MEANS FOR FORMING SOLID GRANULES FROM LIQUID SUPPLY MEANS

Kouzo Ueda, Kyoto, and Zitumi Kimoto, Takarazuka, both of Japan, assignors to Osaka Gas Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1972, Ser. No. 242,926
Claims priority, application Japan, Apr. 14, 1971, 46-24089
Int. Cl. B22d *23/08*
U.S. Cl. 425—8 **12 Claims**

1. An apparatus for reducing molten material to substantially uniform granular form comprising a supply means of meltable material, means for maintaining the meltable material at a predetermined flowable temperature, conduit means associated with said last-named means for transporting the flowable material to a bath in a substantially closed chamber, rotary means positioned in said chamber, a plurality of pin members extending radially from said rotary means and having respective end portions thereof operatively positioned for scooping up limited, substantial uniform, separate portions of

said molten material from said bath and for flinging off separately said limited portions of molten material scooped up through space and thence into a trough-like member positioned adjacent to said chamber, a coolant in said trough-like member for cooling said portions of material to solidify same



in form of substantially uniform spheres, and means for advancing the granular material through said coolant to a means for separating the granules from the coolant, whereby the granules of substantially uniform diameter and relatively large size are produced.

3,854,851

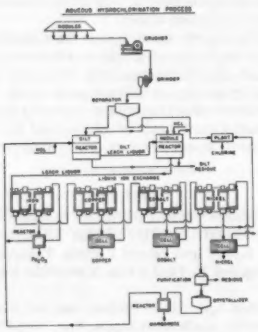
METHOD FOR SEPARATING NICKEL FROM COBALT IN AQUEOUS SOLUTION

Paul H. Cardwell, Zanoni, Va. 23191, and James A. Olander, P.O. Box 36, Gloucester Point, Va. 23062

Continuation-in-part of Ser. No. 40,564, May 26, 1970, abandoned, and a continuation-in-part of Ser. No. 40,565, May 26, 1970, abandoned, and a continuation-in-part of Ser. No. 40,587, May 26, 1970, abandoned, and a continuation-in-part of Ser. No. 40,590, May 26, 1970, abandoned, and a continuation-in-part of Ser. No. 40,586, May 26, 1970, abandoned, and a continuation-in-part of Ser. No. 40,585, May 26, 1970, abandoned. This application Apr. 26, 1972, Ser. No. 247,693

Int. Cl. C01g *3/00, 51/02, 53/00, 45/00*

U.S. Cl. 423—24 **11 Claims**



1. A process for the separation of individual metal values from an aqueous solution comprising a mixture of dissolved metal values, as the halides, the solution comprising as the primary metal value, manganese, and as secondary metal values, cobalt and nickel, the process comprising: (1) extracting cobalt halide from the aqueous solution with an organic amine solution, the amine being selected from the group consisting of secondary amines, tertiary amines and quaternary amines, so as to form an organic amine solution extract containing cobalt tetrahalide complex and some manganese, and an aqueous first raffinate, substantially depleted in cobalt halide; (2) separating the cobalt and manganese values from the organic amine extract into individual aqueous solutions by selectively stripping the manganese value from the extract with from about 1 to about 12N HCl aqueous solution to form an aqueous solution of manganese halide and an organic solution substantially depleted in manganese value and then stripping the cobalt value from the organic solution using an aqueous solution ghaving a pH of not greater than about 5, to form an aqueous solution of cobalt halide; (3) extracting the nickel from the first raffinate with a liquid ion exchange agent to form an aqueous second raffinate containing manganese halide and substantially depleted in nickel value and an organic extract containing the nickel value; and (4(stripping the nickel value from the organic extract with an acidic aqueous solution.

3,854,852

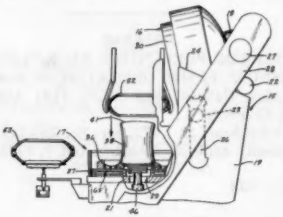
METHOD AND APPARATUS FOR FORMING A TIRE

Russell W. Carter, Des Moines, Iowa, assignor to Corn States Metal Fabricators, Inc., Des Moines, Iowa

Division of Ser. No. 323,041, Jan. 12, 1973,. This application May 22, 1974, Ser. No. 472,001

Int. Cl. B29h *5/02*

U.S. Cl. 425—40 **3 Claims**



1. Tire forming apparatus for shaping and curing a preformed tire band within separable upper and lower mold members wherein an inflatable shaping mechanism is located axially of the lower mold member comprising:

a. means for moving the upper mold member to a closed position relative to the lower mold member, said upper mold member in the closed position therefor forming a tire cavity with the lower mold member,

b. fluid passage systems in said mold members including a plurality of passage ways having terminal end portions open to said tire cavity and spaced circumferentially in the side wall of said tire cavity,

c. valve units corresponding to said passageways, each valve unit including a stem member reciprocally movable within an associated terminal end portion for movement to a retracted position to open an associated passageway and to an extended position to close said passageway, said stem member having an end face flush with the cavity side wall to form a continuous surface therewith when the stem member is in the extended position therefor,

d. means for inflating said shaping mechanism under an initial pressure to provide for the expansion of the tire band to a first position adjacent to but spaced from the side wall of the tire cavity, to form an air chamber about said tire band,

e. means for evacuating air from said air chamber through said passageways when the stem members are in the retracted positions therefor to produce a sub-atmospheric pressure in said air chamber,

f. means for moving said stem members to the extended positions therefor when the sub-atmospheric pressure in the air chamber is at a predetermined value,

g. means for heating and inflating said shaping mechanism to a predetermined curing temperature and pressure to expand the tire band into conforming engagement with the cavity side wall, and

h. means for moving said upper mold member to the open position therefor when the tire has been cured.

3,854,853

SEGMENTAL MOLD

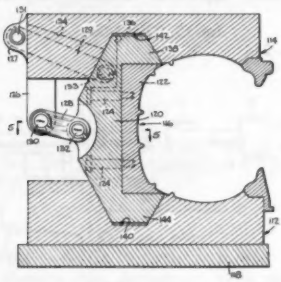
Henri J. Mirtain, Compiegne, France, assignor to Uniroyal, a Societe Anonyme, Clairoix, France

Filed July 12, 1973, Ser. No. 378,456

Claims priority, application France, Aug. 25, 1972, 72.30386

Int. Cl. B29h *5/04*

U.S. Cl. 425—47 **8 Claims**



1. A segmental mold comprising: a pair of vertically spaced annular sidewall-shaping members coaxially confronting one another; means for moving one of said members axially relative to the other; an annular array of tread-shaping segments concentrically interposed between said members; and linkage means for pivotally connecting respective ones of said segments to one of said members, said linkage means cooperating with said segments for effecting displacement of the latter radially from an open annular array wherein said segments are spaced from one another to a closed annular array of reduced extent wherein said segments abut one another and define a tire-curing mold cavity with said members, the upper sidewall-shaping member including wedge means operatively associated with a corresponding axial end portion each of said segments for initially assisting in radially displacing said segments simultaneously and subsequently removably constraining each of the latter against movement relative to one another in said closed annular array, said linkage means including a plurality of pairs of links each of which at one end is pivotally articulated to the upper sidewall-shaping member and at the other end to a corresponding one of said segments, one link of each said pair being longer than the other and cooperating with the latter to limit gravitational displacement of its corresponding segment by swinging the latter into engagement with a lower portion of said wedge means upon axial separation of said sidewall-shaping members from one another.

3,854,854

HIGH PRESSURE PRODUCING APPARATUS

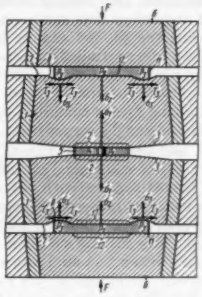
Leonid Fedorovich Vereschagin, Kutuzovsky prospekt, 1/2, kv. 231, Moscow, and Lev Grigorievich Khvostantsev, ulitsa Shkolnaya, 4, kv. 62, Moskovskaya oblast, Podolsky raion, Akademgorodok, both of U.S.S.R.

Filed Oct. 2, 1973, Ser. No. 402,858

Int. Cl. B30b *11/32*

U.S. Cl. 425—77 **5 Claims**

1. An apparatus for producing high pressure, comprising a pair of similar coaxially arranged opposing dies, a test sample received intermediate the central portions of the respective faces of said dies, facing each other, said test sample being surrounded by a medium that is plastic under pressure and capable of transmitting to said test sample the pressure produced as said dies are being driven toward each other under the action of an external effort, each said die having in the face thereof, adapted to be acted upon by said external effort, an annular groove of which the external and internal edges relative to the centre of said face extend along respective



concentric imaginary circles of which the centre is said centre of said face; means driving said dies together by exerting thereupon said external effort; a solid medium placed intermediate of said driving means and said face of each said die, facing said means, said last-mentioned medium being solid and plastic under pressure and adjoining said respective faces at the central portion thereof defined by said groove, said medium overlying said groove along the entire length thereof and at least partly in cross-section.

3,854,855

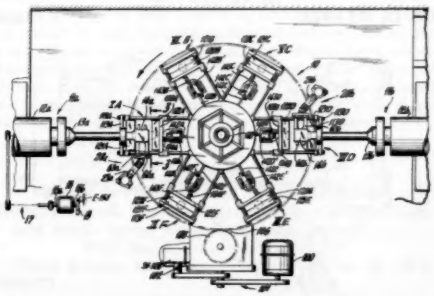
METHOD AND APPARATUS FOR MULTIPLE BLOW MOLDING WITH ROTARY TURNTABLE

Donald M. Pollock, Morristown, and Fulton W. Hallowell, Rumson, both of N.J., assignors to Consupak, Inc., Morristown, N.J.

Filed June 8, 1973, Ser. No. 368,249

Int. Cl. B28b *17/00;* **B29c ; B29f**

U.S. Cl. 425—142 **3 Claims**



1. A blow molding apparatus comprising a rotary indexing turntable, means to rotatably index the turntable at a predetermined number of circumfrentially spaced stations, said turntable having at least one partible mold mounted therewith for each of first and second indexing stations, means to provide opened molds at said first and second stations, first means to form a first parison operatively positioned at said first station, and second means to form a second parison operatively positioned at said second station circumfrentially spaced from said first station, said first and second parisons being formed at about the same time, means to position said first parison and means to position said second parison be-

tween the parted sections of each of the respective molds at the respective first and second stations, means to close said opened molds on said extruded and positioned parisons at the respective first and second stations, first means and second means to introduce air under pressure to the interior of each of the respective parisons to expand the parisons to conform to the interior of the respective molds so as to form hollow objects therein, means to cool each of said objects during rotation of the turntable and circumfrential transfer of the molds from said respective first and second stations, and means for removing the formed objects from the opened molds so as to permit other extruded parisons to be positioned therebetween, and wherein said first parison forming means comprises a first extruder and first die means and wherein said second parison forming means comprises a second extruder and second die means, said die means being spaced from said respective molds, and wherein said rate of first extrusion is about equal to the rate of said second extrusion, and means to interconnect the first extruder to each of said means to position said parisons between the respective opened molds, so as to simultaneously position said first and second parisons, said means to simultaneously position said first and second parisons comprising cam means mounted with said interconnecting means and switch means operatively mounted with said cam means to be actuated thereby, whereby the first extrusion rate is proportional to the rate of actuating said switch means, said switch means being interconnected to first parison severing and gripping means and first parison lowering means and to second parison severing and gripping means and second parison lowering means, so that upon actuation of said switch means said first parison and said second parison are simultaneously severed from the respective extruder die means, gripped and then lowered into position between the opened partible molds.

3,854,856

INJECTION MOLDING MACHINE WITH ACCESSIBLE EJECTOR ASSEMBLY

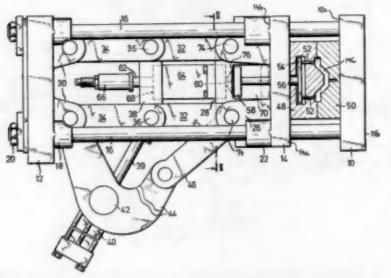
Richard Herbst, Munich; Erwin Meingast, Treuchtlingen, and Ernst Wuerl, Weissenburg, all of Germany, assignors to Krauss Maffei Aktiengesellschaft, Munich, Germany

Filed Aug. 15, 1972, Ser. No. 280,901

Claims priority, application Germany, Sept. 15, 1971, 2146147

Int. Cl. B29f *1/14*

U.S. Cl. 425—173 **6 Claims**



1. In an injection molding machine, a combination comprising a first platen; a second platen movable toward and away from said first platen, said platens having first sides facing each other and second sides facing away from eacha other and one of said platens having at said second side thereof reinforcing means defining a compartment and two lateral windows located opposite each other, communicating with and affording access to said compartment; and ejector means including at least one knockout element movable relatife to said one platen, and coupling means connecting said knockout element with said actuating means, said coupling means comprising a crosshead having a portion located in said compartment and further portions extending into and movable relative to said lateral windows in response to operation of said actuating means.

3,854,857

MOLD OPENING AND CLOSING DEVICE FOR AN APPARATUS MAKING HOLLOW BODIES FROM THERMOPLASTIC MATERIAL

Stefan Fischer, Lohmar; Peter Galden, Cologne-Ehrenfeld; Helmut Scharrenbroich, Neuenhaus/Siegburg, and Dieter Wollschlager, Oberpleis, all of Germany, assignors to Zinpro Corportion, Excelsior, Minn.

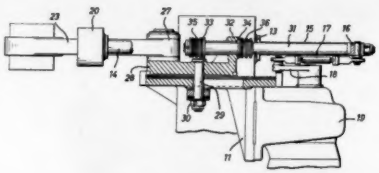
Continuation of Ser. No. 142,523, May 12, 1971, abandoned.

This application Sept. 4, 1973, Ser. No. 394,080

Claims priority, application Germany, May 12, 1970, 2023094

Int. Cl. B29c *5/06*

U.S. Cl. 425—214 **6 Claims**



1. A device for opening and closing mold halves held in a pair of tong-like arm holding elements and for moving same back and forth with respect to a machine frame between a receiving position for a moldable pre-form to another position for shaping or blowing same, comprising: first and second carriage means mounted on said machine frame and being adapted to reciprocate in said machine frame; a single drive means adapted to respectively reciprocate both of said first and second carriage means; the second carriage means carrying said mold halves and having brake means for restraining the motion of said second carriage means with respect to said machine frame; said first carriage means being connected to said second carriage means and being provided with resilient stop means for arresting the motion of said first carriage means with respect to said second carriage means at the open and closed positions of said arm holding elements, and said second carriage means moving from one position to another position upon the continued respective motion of said drive means overcoming said resilient stop means.

3,854,858

ARRANGEMENT FOR PROCESSING BANDS OF SYNTHETIC MATERIAL IN DEFORMABLE STATE

Helmet Bacher, Neugermering, Germany, assignor to Krauss-Maffie Aktiengesellschaft, Munich, Germany

Filed Jan. 26, 1973, Ser. No. 327,218

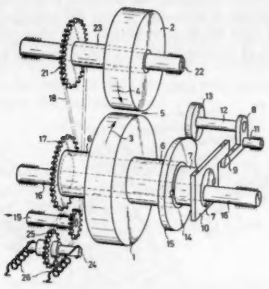
Claims priority, application Germany, Jan. 29, 1972, 2204215

Int. Cl. B29c *15/00*

U.S. Cl. 425—367 **7 Claims**

1. An arrangement for processing bands of synthetic plastic material in deformable state, comprising a pair of cooperating rollers mounted for rotation about at least substantially parallel axes and having respective circumferential surfaces defining with one another a gap through which the bands are to pass; drive means for driving at least one of said rollers in rotation; and varying means for periodically varying the width of said gap, including a shaft extending through one of said rollers and mounted for eccentric movement relative to the axis associated with said one roller, and cam means including

a cam arm mounted laterally of said shaft for pivoting movement about a pivot axis, for controlling the periodicity of such



eccentric movement, and a lever mounted on and projecting laterally from said shaft and engaging said arm from above and in direction of rotation of said shaft.

3,854,859

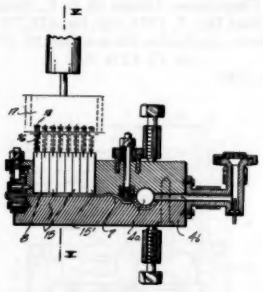
SHAPING HEAD FOR PLASTIC MOLDING MACHINES

Manuel Mamerto Sola, Billinghurst 1850, piso 5, dto. B-Buenos Aires, Argentina

Filed Oct. 19, 1972, Ser. No. 298,011

Int. Cl. B29f *3/04*

U.S. Cl. 425—466 **5 Claims**



1. In a shaping head for extrusion molding plastic articles an inner channel having a rectangular section and substantially flat faced walls, a number of longitudinally oriented, spaced slots through at least one of the faces of said inner channel, a plate of a width to sealingly fit the slot being arranged in each one of said slots, said plate being adapted to be displaced between a first position in which the slot has its maximum height to a second position in which said slot is inoperative because said plate's edge engages the opposite face of said channel, and wherein each one of said plates is comprised of several mutually independent plate sections which are engaged at their edges, and each one of said plate sections is associated with a common control that enables each unit to resiliently and separately yield.

3,854,860

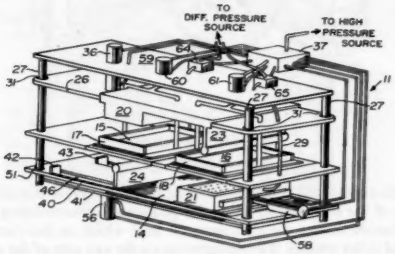
APPARATUS FOR FORMING PLASTIC ARTICLES FROM SHEET MATERIALS

John Henry Haag, Evansville, Ind., assignor to Kent Plastics Corporation, Evansville, Ind.

Continuation of Ser. No. 103,545, Jan. 4, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,142

Int. Cl. B29c *17/04, 27/00*

U.S. Cl. 425—502 **4 Claims**



1. Apparatus for forming hollow plastic articles from sheet material, said apparatus comprising: a supporting frame structure, first and second cooperable forming members each of which include a die face of predetermined contour, said forming members being movably mounted to said supporting frame to permit relative reciprocal movement therebetween in two substantially perpendicular directions, the first of said directions being to bring said die faces together and apart, at least one plug assist means comprising a rod having a rounded ball section connected thereon, said rod fixedly mounted to one of said forming members and disposed from the die face of that forming member in the second of said directions of reciprocal movement, said rounded ball section of said rod defining an engaging surface for contact along being substantially smaller than the total surface of said sheet material, means for positioning plastic sheet material adjacent each of said die faces, means for urging the forming members to one extreme of the reciprocal movement in the second direction and aligning the at least one rod opposite the die face of the other forming member, means for urging the forming members and attached die faces and said rod attached thereto together and apart through the reciprocal movement in said first direction thereby urging the sheet material against at least one die face by means of said engaging surface of said rod, means for releasably securing the sheet material to the die faces, means for urging forming members to the other extreme of reciprocal movement in the second direction and aligning the opposed die faces and means for bringing the die faces and sheet material together whereby a hollow plastic article is formed.

3,854,861

ROLLERS FOR SHAPING SHEET MATERIAL

Geoffrey Worrall, Wantage, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 4, 1972, Ser. No. 311,529

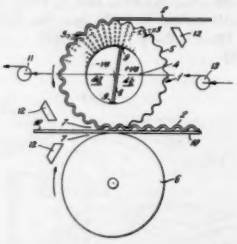
Claims priority, application Great Britain, Feb. 22, 1972, 8086/72

Int. Cl. B29d *9/00*

U.S. Cl. 425—504 **4 Claims**

1. Apparatus comprising a pair of rollers defining a nip through which superimposed sheets of thermoplastic material may be passed so as to be welded together to form bandoleer-like articles, one of said pair of rollers having a corrugated periphery and the other roller having a plain periphery, the corrugated roller also having a hollow center, a plurality of airflow passageways extending between the hollow center and the corrugated periphery, stationary partition means for dividing the hollow center into two separate compartments which, at the interior surface of the hollow roller, are located on opposite sides of a plane through the nip and the centers of the

two rollers such that as the corrugated roller rotates, passageways on opposite sides of the said plane through the nip are connected to different of said compartments, air suction means for connecting to suction the compartment from which,



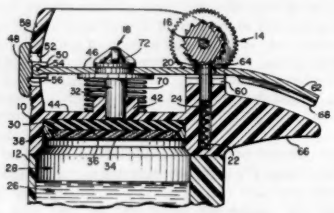
as the corrugated roller rotates, the passageways on the entry side of the nip extend, air discharge means for connecting to a pressure source the compartment from which, as the corrugated roller rotates, the passageways on the exit side of the nip extend and means for heating the rollers.

3,854,862

DISPOSABLE LIGHTER

Milo E. Webster, Braintree, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Aug. 30, 1973, Ser. No. 392,943
Int. Cl. F23q *1/04*
U.S. Cl. 431—254 **12 Claims**



12. A gas lighter chargeable with a liquid fuel supply comprising in combination a body forming in part a fuel chamber, a fuel outlet, a fuel flow control assembly between said fuel chamber and said fuel outlet, said fuel flow control assembly comprising a pierced, flexible sheet member of elastomeric material, a thin gas porous but liquid impermeable sheet membrane, and a layer of foam material between said sheet member and said sheet membrane in sandwich relation therewith, said fuel flow control assembly adapted when flexed downwardly to release a supply of fuel from said fuel chamber to said fuel outlet, means to flex said fuel flow control assembly downwardly, and ignition means adjacent said fuel outlet.

3,854,863

FURNACE ASSEMBLY AND METHOD FOR HEATING WORKPIECES

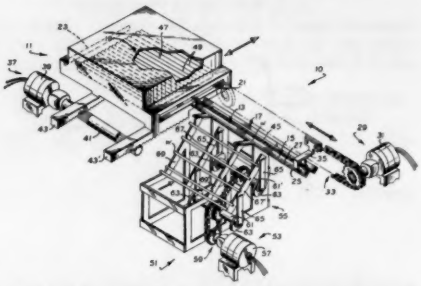
Harvey C. Lubold, Jr., R.D. No. 1, and Glenn H. Roberts, R.D. No. 1, Box 118, both of Towanda, Pa. 18848

Filed Jan. 23, 1974, Ser. No. 435,664
Int. Cl. F27b *9/14*
U.S. Cl. 432—11 **9 Claims**

1. A furnace assembly comprising:

a movable furnace adapted for sequentially moving in a substantially rectilinear direction, said furnace including a heating chamber therein, a serrated hearth member positioned substantially within said heating chamber, an inlet through which at least one workpiece may enter said heating chamber, and an outlet through which said workpiece may exit said heating chamber; and an outlet through which said workpiece may exit said heating chamber;

a stationary elongated receiving means positioned relative to said inlet of said furnace for receiving said workpiece; a first driven elongated bar member positioned relative to said elongated receiving means for engaging at one end thereof said workpiece within said elongated receiving means and feeding said workpiece through said inlet into



said heating chamber of said furnace whereby said workpiece will be positioned within one of said serrations in said hearth member; and

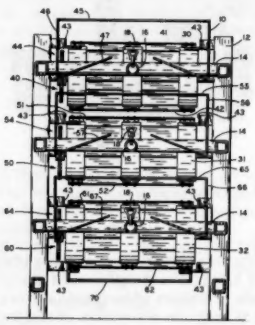
a second driven elongated bar member oriented in a juxtaposed relationship to said first elongated bar member, said second elongated bar member substantially longer than said first bar member and adapted for engaging at one end thereof said workpiece within said hearth member of said heating chamber and causing said workpiece to exit said furnace through said outlet.

3,854,864

OVEN ARRANGEMENT

Fausto Celorio Mendoza, Cumbres de Acultzingo No. 185, Lomas de Chapultepec, Mexico 10, D. F., Mexico

Filed Dec. 5, 1973, Ser. No. 421,778
Claims priority, application Mexico, June 26, 1973, 144536
Int. Cl. F27b *9/02*
U.S. Cl. 432—130 **13 Claims**



1. A multiple pass oven comprising:

a frame, a plurality of superposed conveyors in said frame each having upper and lower reaches and the lower reach of each conveyor facing the upper reach of the conveyor next therebeneath, heating means beneath the upper reach of each conveyor for supplying heat thereto, means forming tunnels in said frame with each tunnel having a top wall extending over the top of the upper reach of a respective conveyor and side walls extending downwardly

from the side edges of the top wall, said side walls having bottom edges upwardly from the top wall of the tunnel next therebeneath to provide a space for flow of air to said heating means, each conveyor comprising a series of plates extending transversely to the direction of travel of the conveyors, and hinges interconnecting the adjacent plates of each conveyor, said frame including rollers about which said conveyors pass at the reversing points thereof, the upper reach of each conveyor having a receiving end and a discharge end and adapted to receive articles to be baked at the receiving end and to discharge articles from the discharge end.

3,854,865

KILN FOR CERAMIC PRODUCTS

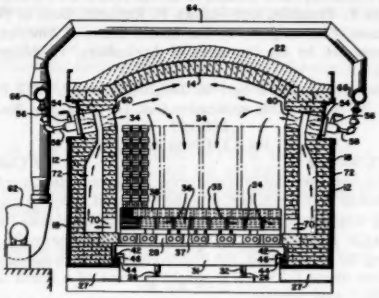
Gordon C. Fay, Pittsburgh, Pa., assignor to Hendryx Engineers Incorporated, Pittsburgh, Pa.

Filed Nov. 9, 1973, Ser. No. 414,444

Int. Cl. F27b *9/00*

U.S. Cl. 432—137 **12 Claims**

1. A kiln for firing ceramic ware comprising a generally rectangular enclosure having movable floor means for supporting the ware and closing the bottom of the enclosure, said floor means being movable into and out of the kiln and having openings for flow of gas therethrough, means for inducing a recirculating flow of hot gases downward through the ware including a plurality of burners in the upper part of the kiln, means for supplying at least sufficient air to said burners for complete combustion to induce high velocity flow of combustion gases, said burners constituting the sole source of heat for the kiln, and means for exhausting gas flowing downward



through said openings in the floor means and directing at least a part of said gas back to the burners for mixing with the combustion gases from the burners for recirculation downward through the ware.

3,854,866

RECURABLE CROSSLINKED CELLULOSE FABRICS FROM METHYLOL REAGENTS AND POLYCARBOXYLIC ACIDS AND METHOD OF MAKING

William E. Franklin, and Stanley P. Rowland, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 248,200, April 27, 1972, Pat. No. 3,776,692. This application Oct. 16, 1972, Ser. No. 298,167

Int. Cl. D06m *1/00*

U.S. Cl. 8—116 R 3 Claims

1. An improvement in the process of impregnating a cellulosic textile with a solution of a methylolated cellulose crosslinking reagent and a polycarboxylic acid having at least three carboxylic acid groups, curing the textile and thermally reforming the cured textile, the improvement comprising including from about 0.25 to 1.0 weight percent of a latent acid catalyst in said solution.

3,854,867

PROCESS FOR REACTING SULTONES WITH CELLULOSIC MATERIALS TO PRODUCE CELLULOSIC MATERIALS HAVING BOTH BASIC AND ACIDIC GROUPS AND PRODUCT PRODUCED

Truman W. Ward; Ruth R. Benerito, both of New Orleans; Ralph J. Berni, and Donald M. Soignet, both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 15, 1972, Ser. No. 306,771

Int. Cl. D06m *1/00*

U.S. Cl. 8—116 R 6 Claims

1. A process for imparting Zwitterion-exchange properties to diethylaminoethyl cellulose, the process comprising contacting said diethylaminoethyl cellulose with an organic solvent solution of about from 5 to 20 percent hydrocarbon sultone at 25° C. to 75° C. for about 1 to 24 hours.

3,854,868

NON-AQUEOUS PROCESS FOR REACTING SULTONES WITH CELLULOSIC MATERIALS AND THE PRODUCT PRODUCED

Truman L. Ward; Ruth R. Benerito, both of New Orleans, and Ralph J. Berni, Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 15, 1972, Ser. No. 306,770

Int. Cl. D06m *1/00*

U.S. Cl. 8—116 R 10 Claims

1. A process for producing sultone celluloses having ion-exchange properties with acid character, the process comprising reacting, in a non-aqueous solvent, washed alkali earth cellulosate with sultone so as to yield a fibrous sultone cellulose.

3,854,869

METHOD OF IMPARTING CREASE RESISTANCE TO CELLULOSIC FIBERS BY TREATING THEM WITH TETRAOXYMETHYLENE

Yuichi Yanai, Okazaki, Japan, assignor to Nisshin Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1972, Ser. No. 279,362

Int. Cl. D06m *13/12*, *13/14*

U.S. Cl. 8—116.4 4 Claims

1. A method for imparting crease resistance and soft touch to a material selected from cellulosic fibers, and textile fabrics and knittd goods containing cellulosic fibers comprising treating said material at a temperature of about 120℃ to 130℃ with 0.1 to 10% tetraoxymethylene in the presence of a catalytic mixture of 0.02 to 10% of a metal-boron fluoride and 0.02 to 10% of an organic carboxylic acid, said percentages being by weight of said material.

3,854,870

PROCESS FOR TREATING CONTINUOUS FILAMENTS

Robert Allan Boyer, and Anthony Hing Chen, both of Columbus, Ohio, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 19, 1973, Ser. No. 342,731

Int. Cl. D06l *1/12*

U.S. Cl. 8—139 8 Claims

1. A process for treating a tow of continuous protein filaments with a treating liquid which comprises immersing the tow of continuous protein filaments in the treating liquid and concurrently passing the tow of continuous protein filaments and the treating liquid longitudinally and substantially horizontally along a conduit while simultaneously passing a plurality of fluid streams transversely through the tow of continuous protein filaments to agitate the protein filaments and enable the treating liquid to contact all the protein filaments, the amount and flow rate of said treating liquid being such as to completely cover the protein filaments.

3,854,871

TEXTILE CLEANING PROCESS FOR SIMULTANEOUS DRY CLEANING AND FINISHING WITH STAIN REPELLENT

Albert Robert Eanzel, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 31, 1973, Ser. No. 328,382

Int. Cl. D06l *1/04*, *1/08*

U.S. Cl. 8—142 3 Claims

1. A process for simultaneous cleaning and finishing of soiled textile materials in which the textile is

A. treated at from about 0° to about 100°C. for from about 1 minute to about 30 minutes with a composition consisting essentially of

a major amount of a textile dry cleaning solvent;

a minor amount of water;

an amount sufficient to give add-on of 0.05 to 0.5 percent, based on the dry weight of textile of a polyfluoroalkyl substituted stain repellent; and

5 to 20 percent, based on the weight of stain repellent, of an emulsifying agent which does not negate the stain repellency; and then

B. the treated material is dried.

3,854,872

PROCESS FOR DYEING OF POLYACRYLONITRILE FIBERS

Jean Balland, Chateaurenault, France, assignor to Societe dite: Manufacture de Produits Chimiques PROTEX Societe Francaise a Responsabilite Limitee Siege, Paris, France

Filed Mar. 29, 1973, Ser. No. 345,850

Claims priority, application France, Apr. 7, 1972, 72.12861

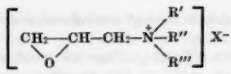
Int. Cl. D06p *5/06*

U.S. Cl. 8—169 4 Claims

1. A process for dyeing polyacrylonitrile fabrics in an aqueous bath containing a cationic colorant comprising adding to the bath as a retarding and equalization of dyeing agent, a quaternized polyamino amide obtained by the condensation of a fatty diacid with a polyamide having at least four reactive hydrogen atoms per molecule having the formula

$$H_2N—(R—NH)^x—H$$

in which x is at least equal to 1 and R is an alkylene radical containing one to five carbon atoms, the polyamino amide then being quaternized by a salt of epoxy propyl trialkyl ammonium of the formula



in which R′, R″ and R‴ are alkyl radicals, identical or different, having one to three carbon atoms, and X is a radical selected from the group consisting of Cl^-, NO_3^- and SO_4^{--}.

3,854,873

USE OF SODIUM BISULFITE IN AN IMPROVED PROCESS FOR THE TREATMENT OF CELLULOSE TEXTILE MATERIALS WITH CARBAMATE FINISHING AGENTS AND SULFUROUS ACID

John D. Reid; Robert M. Reinhardt, both of New Orleans; Russell M. H. Kullman, and Norton A. Cashen, both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 13, 1972, Ser. No. 314,651

Int. Cl. D06p *1/00*

U.S. Cl. 8—187 **6 Claims**

1. An improved process in the treatment of cellulose-containing fabrics with a methylolated carbamate-sulfurous acid formulation which process comprises adding a minor amount of sodium bisulfite to said formulation, impregnating the cellulose-containing textile with said formulation and curing the impregnated fabric to impart durable press properties with improved strength-to-wrinkle recovery relationship to the treated fabric.

3,854,874

APPARATUS FOR CONTROLLING THE ATMOSPHERE OF THE STERILE CHAMBER IN AN ASEPTIC PACKAGING MACHINE

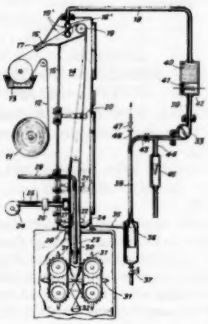
Willi Loliger, and Rudolf Schmied, both of Konolfingen, Switzerland, assignors to Alpura Koreco A. G., Konolfingen, Switzerland

Filed July 7, 1972, Ser. No. 269,518

Claims priority, application Switzerland, July 9, 1971, 10096/71

Int. Cl. A61l *3/00*; **B65b** *61/00*

U.S. Cl. 21—91 **13 Claims**



1. In combination with an aseptic packaging machine having a sterile chamber in which a packaging material is formed into a flexible tube; an apparatus for controlling the atmosphere of said sterile chamber comprising

a flow circuit including said sterile chamber for a flow of a mixture of chamber air and sterilizing agent vapor forming the chamber atmosphere,

a conveying means in said flow circuit for recirculating the flow,

throttle means between said chamber and said conveying means for generating an above-ambient pressure in said chamber, and

means for limiting the concentration of the sterilizing agent in the atmosphere filling said chamber.

3,854,875

PLANT FOR TREATING WATER, IN PARTICULAR SEWAGE OR SLUDGE

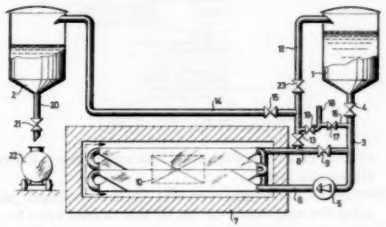
Ernst Bosshardt, Winterthur, Switzerland, assignor to Sulzer Brothers Ltd., Winterthur, Switzerland

Filed Oct. 7, 1971, Ser. No. 187,326

Claims priority, application Switzerland, Oct. 7, 1970, 14848/70

Int. Cl. A61l *3/00*

U.S. Cl. 21—102 R **5 Claims**



1. A sewage sludge treatment plant comprising

a source of gamma radiation;

duct means disposed about said source of gamma radiation to provide a closed loop for the sludge, said duct means having at least two sections exposed to different sides of said source and defining an unencumbered flow path for the sludge;

means for forming a batch of sludge from a supply of sludge to be irradiated, said means being connected to said duct means to deliver said batch of sludge to said duct means; and

a pump connected within and to said duct means for repeatedly circulating a delivered batch of sludge through said closed loop of said duct means from a delivery side of said pump through said unencumbered path in said sections of said duct means to an input side of said pump.

3,854,876

METHOD FOR MONITORING AND CONTROLLING THE EFFICIENCY OF A CHEMICAL PROCESS

Robin Patrick Rankine; David George Earl, and Roger Mellor, all of Calgary, Alberta, Canada, assignors to Western Research & Development Ltd., Calgary, Alberta, Canada

Filed Aug. 7, 1972, Ser. No. 278,241

Int. Cl. G01n *21/34*, *31/12*

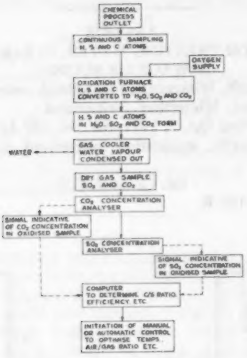
U.S. Cl. 23—230 R **11 Claims**

1. A method for monitoring and controlling the production of a chemical substance by a chemical process, which method comprises:

obtaining a sample from an outlet of the chemical process; chemically treating the sample to convert all the sample components, containing a first chemical element which is also a constituent of the chemical substance, into one chemical compound, without the addition to the sample of said element, and to convert all the sample components containing a second chemical element, which is not

a constituent of the chemical substance and the flow rate of which is substantially the same at the outlet of the chemical process as it is at the inlet of the chemical process, into one chemical compound, without the addition to the sample of said second chemical element;

measuring the ratio of the concentrations of the two chemical compounds and determining therefrom a ratio of the


CHEMICAL PROCESS OUTLET
CONTINUOUS SAMPLING H, S AND C ATOMS
OXYGEN SUPPLY
OXIDATION FURNACE H, S AND C ATOMS CONVERTED TO H_2O, SO_2 AND CO_2
H, S AND C ATOMS IN H_2O, SO_2 AND CO_2 FORM
WATER
GAS COOLED WATER VAPOUR CONDENSED OUT
DRY GAS SAMPLE SO_2 AND CO_2
CO_2 CONCENTRATION ANALYSER
SIGNAL INDICATIVE OF CO_2 CONCENTRATION IN OXIDISED SAMPLE
SO_2 CONCENTRATION ANALYSED
SIGNAL INDICATIVE OF SO_2 CONCENTRATION IN OXIDISED SAMPLE
COMPUTER TO DETERMINE C/S RATIO EFFICIENCY ETC
INITIATION OF MANUAL OR AUTOMATIC CONTROL TO OPTIMISE TEMPS AIR/GAS RATIO ETC

number of atoms of the two chemical elements existing in the sample; and

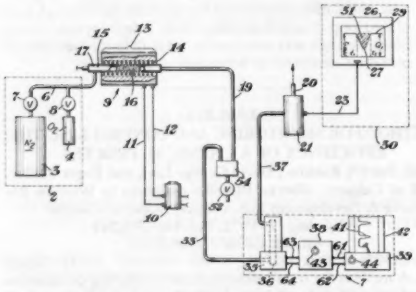
altering a controllable variable in the chemical process using the magnitude of the so determined ratio to minimize the disparity between the actual quantity of the chemical substance produced and recovered and the desired quantity thereof.

3,854,877

COMBINATION TOD-TC ANALYSIS METHOD

Ernoe Csaky, Midland, Mich., and C. Hugh Thompson, Falls Church, Va., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 7, 1972, Ser. No. 278,531
Int. Cl. G01n *31/12*
U.S. Cl. 23—230 PC **4 Claims**



1. A process for simultaneously measuring the total oxygen demand and total carbon of an aqueous dispersion of combustible material which comprises the steps of:

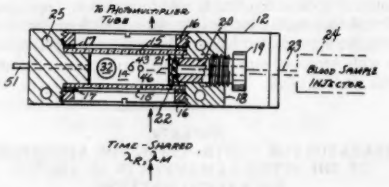
1. flowing a feed gas stream containing a relatively small amount of oxygen at a constant rate through a confined combustion zone heated at a combustion supporting temperature within the range from about 600° to about 1200°C. and, within the combustion zone, flowing the feed gas stream through a combustion supporting catalyst bed,
2. flowing the effluent gas from the combustion zone into a continuous analyzer for quantitatively indicating the carbon dioxide in the gaseous product,
3. flowing the effluent gas from the combustion zone after passing through the carbon dioxide detector of step (2) above, into a continuous quantitative detector for gaseous oxygen and while continuing to flow the feed gas stream, injecting a small amount of the aqueous dispersion of a combustible material into the combustion zone upstream from the catalyst bed, whereby electrical signals correlative with the carbon content of the aqueous sample and its total oxygen demand are produced by the carbon dioxide and oxygen detectors, respectively.

3,854,878

METHOD AND APPARATUS FOR DERIVING OXYGEN ASSOCIATION RATE CURVES FOR BLOOD SAMPLES

Lutz A. Kiesow, Bethesda, Md., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Apr. 13, 1973, Ser. No. 351,014
Int. Cl. G01n *21/24, 33/16*
U.S. Cl. 23—230 B **5 Claims**



1. A method of deriving an oxygen association rate curve for a blood sample comprising deoxygenating the sample, introducing an oxygenating agent into the sample, passing two respective monochromatic wavelengths through the sample while it is being oxygenated, one wavelength at which there is substantially no change in absorbance as between oxygenated and deoxygenated blood and the other wavelength at which there is a relatively large change in absorbance as between oxygenated and deoxygenated blood, and plotting the difference in absorbance for the two wavelengths with time as the sample is being oxygenated.

3,854,879

SAMPLE IDENTIFICATION AND TEST DATA CORRELATION METHOD AND APPARATUS

David Richard Figueroa, Pembroke Pines, and Guenter Ginsberg, Miami, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed July 27, 1973, Ser. No. 383,437
Int. Cl. G01n *1/18*
U.S. Cl. 23—230 R **30 Claims**

1. A method for the semi-automatic correlation of the identification of a sample and test data derived from the sample in the environment of a system in which each of a plurality of the samples is in a sample receiver which incrementally advances along a first path passing a first datum point, and test portions obtained from each sample incrementally advance along a second path passing a second datum point to a testing station, the incremental distance between the second datum point and the testing station being known; the steps comprising:

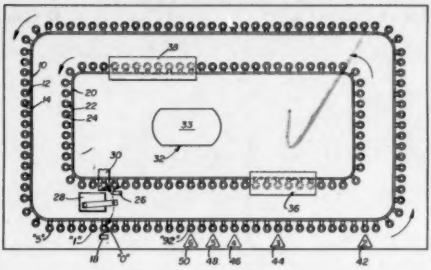
defining the number of tests to be performed on each sample;

establishing a ratio between the rates of the incremental advancing along the second and first paths to be the same as the number of tests per sample;

locating a third datum point along the first path;

providing a progression of indicia on the sample receivers;

presetting a stepping register, having the same progression of indicia as the sample receivers, to the indicia of the sample receiver positioned at said third datum point, prior to start-up of the system; and



synchronizing the stepping of the register with the incremental advancing of the sample receivers along the first path;

whereby, after the start-up of the system, all of the sample test portions will reach the testing station at the same time that the register will step to the indicia of the sample receiver from which the test portions were obtained, so that the sample identity and test portion derived data is correlated.

3,854,880

REAGENT FOR THE DETERMINATION OF CALCIUM

Werner Rathje, Berlin, Germany, assignor to Boehringer Mannheim GMBH, Mannheim-Waldhof, Germany

Filed Aug. 27, 1973, Ser. No. 392,160

Claims priority, application Germany, Aug. 30, 1972, 2242966; July 25, 1973, 2337811

Int. Cl. G01n *33/16*

U.S. Cl. 23—230 B **11 Claims**

1. Reagent for calcium determination comprising a solution of murexide in at least one polyvalent alcohol containing sufficient alkali metal alcoholate to have a pH value of from 10.5 to 13 in aqueous solution.

3,854,881

APPARATUS FOR DETERMINING ORGANIC CARBON CONTENT OF POLLUTED LIQUIDS

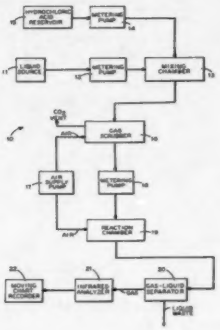
Alfred Cohen, 71 Joyce Ln., Woodbury, N.Y. 11797

Filed Sept. 13, 1971, Ser. No. 179,964

Int. Cl. B01j *9/02*; **G01n** *31/12*, *33/18*

U.S. Cl. 23—253 PC **5 Claims**

1. In an analytical apparatus for determining the total quantity of organic carbon as a pollutant in an aqueous stream by vaporizing a sample taken from the stream and oxidizing to carbon dioxide the total organic carbon in the sample, the determination being on the basis of the measure of carbon dioxide formed per unit measure of the sample, the improvement which comprises a mixing chamber, a first metering pump disposed to deliver into said mixing chamber a continuous flow sample taken from the stream, a second metering pump disposed to deliver into said mixing chamber a continuous flow of liquid reagent for reaction therein with the sample to remove the inorganic carbron content thereof as carbon dioxide; a reaction chamber, means connected to said mixing chamber and to said reaction chamber to deliver from said mixing chamber into said reaction chamber a continuous flow aqueous sample to be analyzed and which is substantially free of inorganic carbon and carbon dioxide, said reaction chamber having an inlet for introducing the aqueous sample to be analyzed and an outlet for the exit of gaseous and vapor products formed from such sample, means for introducing air into said reaction chamber to establish an oxidizing atmosphere therein, a packing material disposed within said reaction chamber for heating the sample introduced, and means for heating said packing material to a temperature at which the organic carbon in the sample is oxidized to carbon dioxide by said atmosphere, said packing material being disposed to define within the reaction chamber an inlet plenum zone



communicating with said inlet to accommodate preheating of the sample by the packing material without contact therewith, and an outlet plenum zone separated from said inlet plenum zone and communicating with the outlet to collect and deliver thereto the gaseous and vapor products from the sample, said outlet plenum zone being communicated with said outlet by a conduit extending through said packing material.

3,854,882

CONTROL SYSTEM IN AN APPARATUS FOR REACTING SILICON WITH NITROGEN

Malcolm E. Washburn, Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Filed Jan. 17, 1973, Ser. No. 324,368

Int. Cl. F23n *5/18*; **G05d** *27/00*

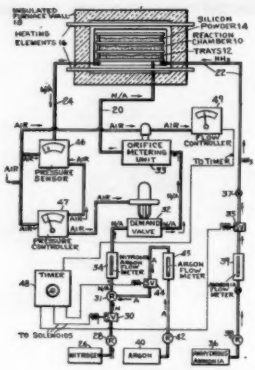
U.S. Cl. 23—253 A **2 Claims**

1. In an apparatus for reacting silicon with nitrogen at elevated temperature in a heated reaction chamber, which includes a source of inert gas, a conduit for introducing inert gas into the reaction chamber, a first valve means in said inert gas conduit, a nitrogen source, a conduit for introducing said nitrogen into the reaction chamber, and a second valve means in said nitrogen conduit for controlling the flow of nitrogen into said reaction chamber, the improvement which comprises means for controlling said second valve means as a function of the pressure in the reaction chamber, means for measuring the rate of flow of nitrogen through the conduit and into the chamber, a timing means, and means responsive to a predetermined rate of nitrogen flow into said reaction chamber:

a. to actuate the second valve means to reduce the flow of nitrogen to the reaction chamber,

b. to actuate the first valve means to introduce inert gas into the reaction chamber, and

c. to actuate said timing means, said timing means being effective after a predetermined interval, to reopen the



second valve means and to close the first valve means to reduce the flow of inert gas.

3,854,883

ANALYSIS VESSEL ENCLOSING AN ANCHORED RING OF SOLID REAGENT

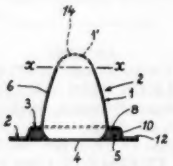
Paul A. F. Montagnon, Le Balme-les-Grottes (Isere), France, assignor to Analytab Products Inc., Carle Place, New York, N.Y.

Filed Apr. 27, 1973, Ser. No. 355,088

Claims priority, application France, May 18, 1972, 72.18387

Int. Cl. G01n *21/06*

U.S. Cl. 23—253 R **6 Claims**



1. A method for preparing a solid portion of material containing a reagent disposed within a vessel and anchored therein, said vessel having sidewalls, a bottom, and a relieved annular channel portion about its periphery near its bottom, said channel portion being dimensioned to cause liquid to be drawn thereinto by capillary action, said method comprising the steps of:

a. introducing a liquid containing the reagent into the vessel in an amount sufficient to cause a quantity of said liquid to enter the channel portion and to be retained therein by capillary action, and

b. dessicating the liquid containing said reagent, whereby the material containing the reagent forms a solid mass which is disposed in the channel portion and thereby becomes anchored in the vessel.

3,854,884

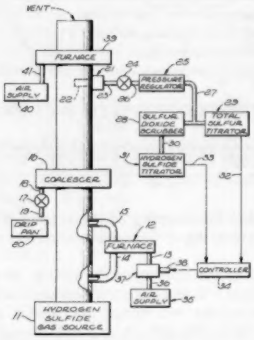
CLAUS PROCESS CONTROL SYSTEM

James Ray Robison, La Mirada, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,379

Int. Cl. G01n *33/16*; **C01b** *17/04*

U.S. Cl. 23—253 A **42 Claims**



1. A process control system comprising: first means for connection with apparatus confining the flow of a fluid, a portion or all of said fluid at least sometimes being hydrogen sulfide gas, said first means having an outlet conduit and being actuable to supply a flow of a sample of said fluid through said outlet conduit; a scrubber having an inlet conduit connected from said first means outlet conduit to receive a first portion of said fluid sample having its own outlet conduit, said scrubber being chargeable with a solution such that said scrubber passes hydrogen sulfide, whenever it is or is carried in said first fluid sample portion, through said inlet conduit thereof to said outlet conduit thereof while said scrubber removes sulfur dioxide from said first fluid sample portion whenever said first fluid sample portion is or carries sulfur dioxide; first and second coulometric titrators having first and second inlet conduits, respectively, and first and second electrical output leads, respectively, said first titrator inlet conduit being connected from said first means outlet conduit to receive a second portion of said fluid sample, said first titrator producing an electrical output signal on said first lead thereof of a magnitude directly proportional to the sum of the concentrations of hydrogen sulfide and sulfur dioxide in said sample fluid, respectively, said second titrator inlet conduit being connected from said scrubber outlet conduit to receive the fluid which passes through said scrubber outlet conduit, said second titrator producing an electrical output signal on said second output lead thereof of a magnitude directly proportional to the concentration of hydrogen sulfide but not sulfur dioxide in said sample fluid; and second means connected from said first and second output leads of said first and second titrators, respectively, for connection with said flow confining apparatus at a location upstream of the connection of said first means therewith, and responsive to said titrator output signals and the magnitudes thereof for introducing oxygen in pure form or in a fluid mixture into said fluid confining apparatus at a variable flow rate and at a temperature to oxidize hydrogen sulfide therein; flow of fluid in said flow confining apparatus, said first means, said scrubber, said first and second titrators, and said second means each forming a link in a closed loop null seeking servo-mechanism in which said second means is actuable to vary or maintain constant said oxygen flow rate in a manner to drive the magnitudes of the output signals of said titrators

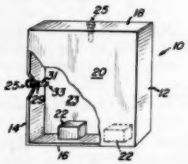
to values indicating that there are concentrations larger than zero of both hydrogen sulfide and sulfur dioxide in said sample fluid and values indicating that the concentration of hydrogen sulfide in said sample fluid times the molecular ratio 64/34 is approximately twice as large as the concentration of sulfur dioxide in said sample fluid.

3,854,885

TOXIC AGENT LEAK DETECTOR

Bernard W. Fromm, Baltimore; Achille Silvestri, Bel Air, and Arthur R. Jones, Jr., Elkton, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 3, 1970, Ser. No. 78,316
Int. Cl. G01n *31/22*
U.S. Cl. 23—254 R **3 Claims**



1. A structure comprising a sealed outer receptacle enclosing at least one inner container containing a vaporizable toxic chemical warfare agent selected from the group consisting of nerve agent and vesicant, and at least one solid transparent threaded detector plug sealingly projecting through at least one threaded aperture in a wall of said receptacle, said plug comprising a solid one-piece transparent material in the shape of a bolt having an enlarged head means for assembling and sealing same and an elongated cylindrical shaped partially threaded body extending therefrom with the end portion of said body containing a coating of chemical detecting material from the group consisting of $[(C_2H_3)_2NC_6H_4]_2CNOH$ with zinc thiocyanate, $[(C_2H_3)_2NC_6H_4]_2$—CNOH with mercuric bromide, disodium salt of diisonitrosoacetone, sodium salt of m-(p-anilinophenylazo) benzene sulfonic acid, and silica gel containing nickel chloride, which changes color upon contact of said chemical warfare agent whereby if agent leakage occurs the change in color of the said detecting material is visible through the said head means and the said body from outside the said sealed outer receptacle.

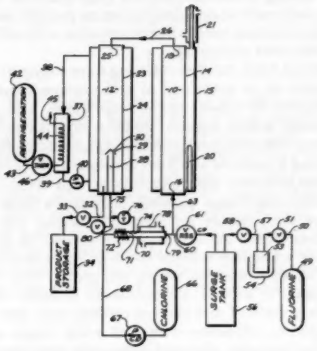
3,854,886

APPARATUS FOR PREPARING CHLORINE PENTAFLUORIDE

John A. Pursley, Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 374,886, June 9, 1964,. This application Nov. 30, 1967, Ser. No. 705,871
Int. Cl. B01b *5/00*
U.S. Cl. 23—260 **8 Claims**

1. Apparatus for producing chlorine pentafluoride comprising a reaction chamber; conduit means for passing fluorine as one gaseous reactant and at least one member of the group consisting of chlorine, chlorine monofluoride and chlorine trifluoride as another gaseous reactant into the chamber adjacent the lower end of the chamber; means for maintaining the contents of the reaction chamber at a temperature sufficiently high to effect reaction between said reactants to form gaseous chlorine pentafluoride in a mixture with gaseous fluorine; a condensing chamber; conduit means for passing said mixture from the reaction chamber at a place adjacent the upper end of the reaction chamber to the condensing chamber at a place adjacent the upper end of the condensing chamber; means for maintaining the temperature in said condensing chamber sufficiently low to effect condensation of chlorine pentafluoride from said mixture; means for withdrawing condensed chlorine pentafluoride from said condensing chamber, and means for recirculating the uncondensed gas from the condensing chamber at a place remote from the upper end of the



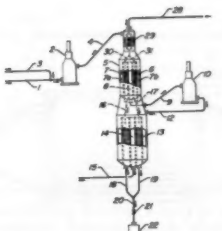
condensing chamber to the reaction chamber at a place adjacent the lower end of the reaction chamber, said means for recirculating comprising means to provide a temperature and density differential of gases in the respective chambers sufficient to be a driving force to recirculate the uncondensed gas.

3,854,887

REACTOR SYSTEM FOR GRAVITY-FLOWING CATALYST PARTICLES

Walter W. Heinze, Chicago, and Edward Schnitta, Bensenville, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 20, 1973, Ser. No. 333,933
Int. Cl. B01j *9/12*
U.S. Cl. 23—288 G **7 Claims**



1. A catalytic reactor system for reacting a reactant stream to obtain a product stream by contact of the reactant stream with catalyst particles movable through said system by gravity flow, which system comprises, in combination:

a. an elongated, vertically-disposed reaction chamber having an inlet in the upper portion thereof for said reactant stream, an outlet in the lower portion thereof for said product stream, an inlet in the upper portion thereof for said catalyst particles, and an outlet in the lower portion thereof for said catalyst particles, said chamber having disposed therein;

b. a tubular-form catalyst-retaining screen having a ring flange at its lower end, coaxially distended substantially

the entire length of said chamber, and having a nominal internal cross-sectional area less than said chamber to provide a reactant annulus in communication with said reactant stream inlet and product stream outlet;

c. a tubular-form, perforated centerpipe, coaxially distended substantially the entire length of said chamber, and having a nominal internal cross-sectional area less then said catalyst-retaining screen to provide an annular catalyst-holding zone in communication with said catalyst particle inlet and outlet;

d. a tubular-form, catalyst-retaining screen support member attached at its lower end to said reaction chamber and having at its upper end a ring flange, said catalyst-retaining screen support member ring flange being in contact with said catalyst-retaining screen ring flange and forming a movable slip joint connection therewith;

e. a tubular-form, dam attached to said screen support member ring flange, coaxially distended a finite distance above the movable slip joint connection, and a finite distance below the upper portion of said chamber, and having a nominal internal cross-sectional area less than said catalyst-retaining screen and greater than said center-pipe, to provide a semi-closed annulus within the lower portion of said catalyst-holding zone; and,

f. particulate refractory matter of a size larger than said catalyst particles, disposed within said semi-closed annulus from the movable connection to a height below the top edge of the dam.

3,854,888

DEVICE FOR THE PURIFICATION OF WASTE GASES OF INTERNAL COMBUSTION ENGINES

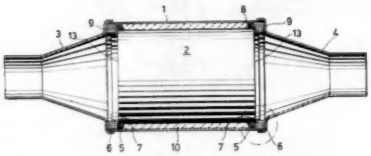
Gunther Frietzsche, and Peter Krause, both of Edenkoben, Germany, assignors to Paul Gillet GMBH, Edenkoben/Pfalz, Germany

Filed Aug. 27, 1973, Ser. No. 391,536

Claims priority, application Germany, Sept. 2, 1972, 2243251

Int. Cl. B01j *9/04*

U.S. Cl. 23—288 F **11 Claims**



1. Device for the purification of waste gases of internal combustion engines comprising a housing having an inlet and an outlet and having at least one monolith through which the waste gases flow and which is disposed in said housing between said inlet and outlet, said at least one monolith having opposed end edges and having one compressed steel body ring in contact with the side portions of the end edges absorbing radial forces and one compressed steel body ring in contact with the end portions of the end edges absorbing axial forces, said rings being disposed at said end edges on contact with the housing, and supporting and protecting rings of thin sheet metal disposed between and in contact with said rings and said end portion edges.

3,854,889

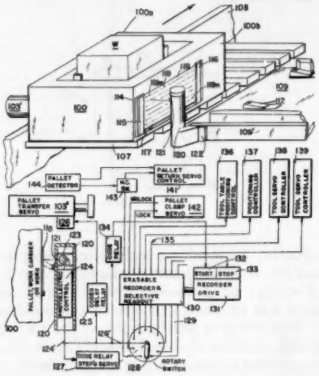
AUTOMATIC PRODUCTION MACHINERY

Jerome H. Lemelson, Metuchen, N.J., assignor to The Molins Organisation Limited, London, England

Continuation of Ser. No. 629,758, April 10, 1967, abandoned, which is a continuation-in-part of Ser. No. 465,812, April 8, 1965, Pat. No. 3,313,014, which is a continuation-in-part of Ser. No. 152,702, Oct. 17, 1961, abandoned, which is a division of Ser. No. 449,874, July 28, 1954,. This application Aug. 29, 1969, Ser. No. 858,560The portion of the term of this patent subsequent to Apr. 11, 1984, has been disclaimed.

Int. Cl. B23p *23/06, 23/04*

U.S. Cl. 29—33 P **27 Claims**



1. An automatic production system including a plurality of machines and a plurality of workholding carriers, means for transferring said carriers to selected of said tools and predeterminately positioning the carriers at the machines for performing predetermined operations on the work held by the carriers, at least certain of said tools being operative to perform cutting operations on work held by said carriers, means at the cutting machines for directing liquid against the work during the cutting operation, drainage means including an exhaust port associated with the carriers for collecting and directing flow of said liquid to said exhaust port, and receiving means at the machines for receiving liquid from the carrier exhaust port.

3,854,890

PLASTIC ARTICLE HAVING A SURFACE CONSISTING OF METAL PLATED AND COLORED NON-PLATED PORTIONS

Akiyuki Akamatsu, Yokohama, Japan, assignor to Showa Denko K. K. and Toyo Kako Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 107,577, Jan. 18, 1971, abandoned. This application Oct. 11, 1972, Ser. No. 296,538

Claims priority, application Japan, Jan. 20, 1970, 45-4829; Mar. 19, 1970, 45-22627; May 15, 1970, 45-41149; June 3, 1970, 45-47469

Int. Cl. B32b *15/08*

U.S. Cl. 29—195 **5 Claims**

1. A plastic article whose surface is partly metal plated and partly ornamented by colored unplated areas, wherein a colored layer comprising coloring material and synthetic resin is formed partially on the surface of the plastic article, said article being subjected to etching, sensitizing, activating, electroless metal plating, and electroplating in the order men-

tioned, said plastic article being made of a polymer selected from the group consisting of acrylonitrile-butadiene-styrene resin, methyl methacrylate-butadiene-styrene resin, acrylonitrile-chlorinated polyethylene-styrene resin, and polypropylene, and said synthetic resin contained in said colored layer being selected from the group consisting of polyvinyl chloride, polyvinyl acetate, vinyl chloride-vinyl acetate copolymers, and ethylene-vinyl acetate copolymers;

characterized in that said synthetic resin constitutes more than 60 percent by weight of the solid ingredients of said colored layer.

3,854,891

TITANIUM COMPOSITE

Joseph A. Chivinsky, Sarver, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Sept. 25, 1972, Ser. No. 292,062
Int. Cl. B32b *15/00*
U.S. Cl. 29—196 **7 Claims**

1. A composite article comprised of at least two bonded metallic layers: at least one of said metallic layers being a metal from the group consisting of titanium and titanium base alloys; at least one of said metallic layers being steel, said steel consisting essentially of up to 2% carbon, up to 0.6% silicon, up to 1.65% manganese, up to 1.5% carbide former, balance essentially iron, said carbide former being from the group consisting of titanium and columbium, said carbide former being present in a carbide former-to-carbon ratio of from 1.5 to 25.

3,854,892

DIRECT BONDING OF METALS WITH A METAL-GAS EUTECTIC

James F. Burgess, and Constantine A. Neugebauer, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 245,890, April 20, 1972, Pat. No. 3,744,120. This application Mar. 1, 1973, Ser. No. 337,143
Int. Cl. B32b *15/00, 15/20*
U.S. Cl. 29—196.1 **7 Claims**

1. A bonded metal-to-metal structure comprising:

a first metal member;

a second metal member;

a eutectic bond between said first and second metal members said eutectic bond consisting essentially of a mixture of atoms of at least said first metal member and one of the group consisting of oxides, sulfides, phosphides and silicides of said metal.

3,854,893

LONG SIDE CHAIN POLYMERIC FLOW IMPROVERS FOR WAXY HYDROCARBON OILS

Albert Rossi, Warren, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed June 14, 1972, Ser. No. 262,719
Int. Cl. C10l *1/20*
U.S. Cl. 44—62 **10 Claims**

1. An oil composition comprising a major amount of petroleum oil selected from the group consisting of residua-containing fuels boiling above 600°F., distillate fuels boiling above 600°F. and crude oils, said petroleum oil being improved in its Flow Point by about 0.0001 to 2.0 wt. percent of a synergistic mixture of 10 to 90 parts by weight of a first polymeric flow improver with 10 to 90 parts by weight of a second polymeric flow improver, said flow improvers having molecular weights in the range of 1400 to 100,000; said flow improvers being selected from the group consisting of:

a. polyester condensation products of 0.8 to 1.6 molar proportions of an alkenyl succinic anhydride containing 18 to 44 linear carbon atoms in the alkenyl group with 0.8 to 1.2 molar proportions of a C_4 to C_{12} polyol containing 3 to 4 hydroxy groups and 0.8 to 1.2 molar proportions of a C_{19} to C_{45} saturated aliphatic monocarboxylic acid;

b. addition polymers consisting essentially of polymer of unsaturated ester, and comprising a major proportion by weight of long chain unsaturated ester represented by the formula:

wherein R_1 is hydrogen or a C_1 to C_5 alkyl group; R_2 is $—OOCR_4$ or $-COOR_4$ wherein R_4 is a long chain C_{18} to C_{44} alkyl group; and R_3 is hydrogen or $-COOR_4$; and

c. copolymers of C_{18} to C_{28} olefin with a C_4 to C_{10} ethylenically unsaturated dicarboxylic acid esterified with one to two molar proportions of C_{18} to C_{44} straight chain alcohol per molar proportion of said dicarboxylic acid, and

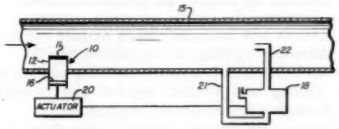
wherein said synergistic mixture is selected from the group consisting of: mixtures of flow improvers (a) and (b), mixtures of flow improvers (a) and (c); and mixtures of flow improvers (b) and (c) as defined above.

3,854,894

PERMEANT GAS METHOD AND APPARATUS

Donald L. Klass, 732 Summit, Chicago, Ill. 60010, and Carl D. Landahl, 2256 W. 112th St., Chicago, Ill. 60643

Continuation-in-part of Ser. No. 25,850, Apr. 6, 1970, Pat. No. 3,634,053. This application, Jan. 10, 1972, Ser. No. 216,719
Int. Cl. C10j *1/28*
U.S. Cl. 48—195 **6 Claims**



1. A method for metering controlled amounts of a permeant gas through a membrane between a body of permeant liquid supply in a permeant reservoir in an enclosed membrane assembly and a flowing gas stream, at least a part of the assembly being a permeable membrane immersed in a flowing gas stream, said membrane having a selected permeation rate for the permeant gas, including the steps of

sensing changes in permeant gas levels in the flowing gas stream from a pre-established level,

reporting such changes in the form of an output signal to operate actuating means, such signal representing the difference between the pre-established level and the sensed permeant level, and

moving the body of permeant liquid supply relative to said membrane to alter the rate of said permeant gas passing through said membrane in proportion to the sensed permeant level in the flowing stream and under operation of said actuating means to thereby meter a controlled amount of the permeant gas through the membrane and maintain the pre-established level of the permeant in the flowing gas stream.

3,854,895
PROCESS FOR PRODUCING A METHANE-RICH GAS USABLE IN PLACE OF NATURAL GAS

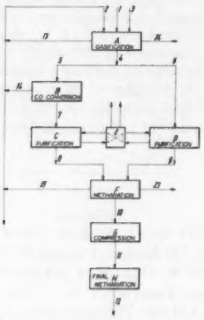
Wolf-Dieter Muller, Nieder-Eschbach, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Reuterweg, Germany

Filed Nov. 15, 1972, Ser. No. 306,651

Claims priority, application Germany, Mar. 16, 1972, 2212700

Int. Cl. C10j *3/16*

U.S. Cl. 48—206 **13 Claims**



1. Process for manufacturing a methane-rich gas usable in place of natural gas which comprises:

a. producing a primary gas by the pressure gasification of coal with steam and oxygen;

b. dividing the primary gas into two streams;

c. converting the carbon monoxide content of one of said streams with steam to carbon dioxide and hydrogen and thereafter washing out the carbon dioxide;

d. purifying said streams by removing catalyst poisons;

e. passing said washed, purified and converted stream through a first methanation stage;

f. dividing the unconverted gas stream from (b) in at least two streams;

g. cooling the product gas from said first methanation stage (e) and passing it in admixture with the first stream of the unconverted gas stream from (f) through a second methanation stage;

h. cooling the product gas from said second methanation stage (g) and passing it in admixture with the second stream of the unconverted gas stream from (f) through a third methanation stage.

3,854,896
METHOD OF CONVERTING COAL TO PIPELINE QUALITY GAS

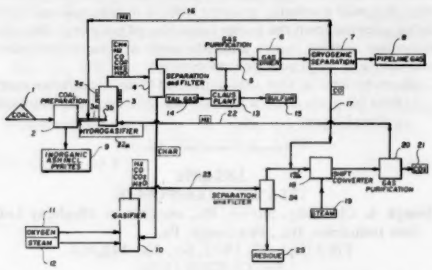
George W. Switzer, Wyomissing, and Carl A. Bolez, Allentown, both of Pa., assignors to Gilbert Associates, Inc., Reading, Pa.

Filed Jan. 29, 1973, Ser. No. 327,873

Int. Cl. C10j *3/06*

U.S. Cl. 48—210 **14 Claims**

1. The method of converting coal to gas comprising introducing coal particles of a size of about 4 microns and smaller into a reactor, rapidly heating said coal particles in said reactor, in the presence of pressurized hydrogen, to between about 700° to about 1,000°C to effect explosive devolatilization and comminution of said coal particles to form gaseous hydrocarbon and highly active char of a size of the order of one one-hundredth micron, and reacting said char directly with said



hydrogen in said reactor to form a product gas containing methane.

3,854,897
HAND GRINDER WITH A DRIVE MOTOR, DESIGNED AS A COMPRESSED-AIR MOTOR

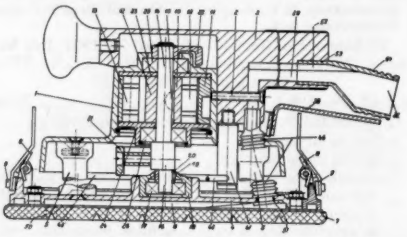
Karl Attinger, Seestr. 21, Holzmaden, Germany

Filed Oct. 2, 1972, Ser. No. 294,206

Claims priority, application Germany, Oct. 1, 1971, 7137280[U]

Int. Cl. B24b *23/04*

U.S. Cl. 51—170 TL **3 Claims**

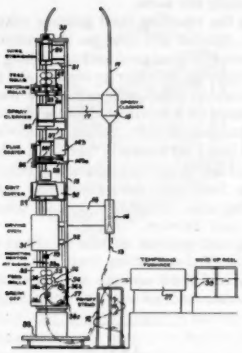


1. A hand grinder comprising a casing, a work plate, means movably supporting the work plate on the casing for oscillating movement with respect thereto substantially in a single plane, a compressed air motor carried by the casing and connected to the work plate for imparting such movement thereto, said work plate having secured on its under side a cover plate, means to secure a grinding means on the underside of the cover plate, the casing having an upper part constituting a handle, means forming a suction passage in the casing for sucking out waste produced by the grinding means, said passage extending to the outside of the casing for connection to a separate suction device driving independently of the grinder, the cover plate having a plurality of openings therethrough opening through the bottom thereof and upwardly into the area of the work plate, the work plate having a hollow on the underside thereof extending substantially over its entire surface area and communicating with the openings in the cover plate, and the hollow space having a suction opening connected to the suction passage, and partition walls extending longitudinally along the plate dividing the hollow into ducts, apertures in the partition walls connecting said ducts, the central region of the plate containing said suction opening and a flexible hose (**46**) connecting the suction opening to the suction passage (**29**).

3,854,898
A METHOD FOR PRODUCING ARMORED ROD AND WIRE SAWS

Paul V. Whitney, Jr., Victoria, Tex.; Robert J. Bolen, Bridgeport, and William W. Cotter, Jr., Stratford, both of Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Continuation-in-part of Ser. No. 12,724, Feb. 19, 1970, abandoned. This application Jan. 24, 1972, Ser. No. 220,294
Int. Cl. B24d *3/08*
U.S. Cl. 51—295 **9 Claims**



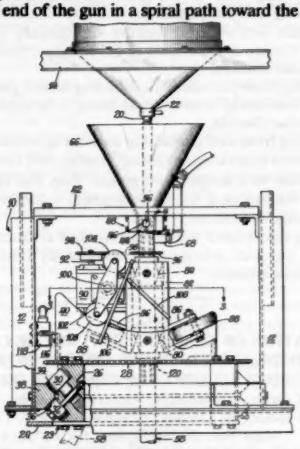
1. The method of progressively applying an abrasive armoring coating to a long length of a base metal, wire substrate, which comprises: continuously feeding said wire in a downward direction through a continuously stirred slurry comprising a homogenous admixture of a flux adhesive and brazing metal powders and thence through a die with a converging orifice of minimum diameter exceeding that of the wire substrate such as to apply thereto a selected coating thickness of said slurry, passing the so coated substrate thence downwardly through a downwardly moving and vibratorily fed mass of abrasive particles directed to converge about said substrate thus to apply thereto an overcoating of said abrasive particles, thence progressively drying said coating and inductively heating the coated substrate to temperature sufficiently high to fuse said brazing metal powders in said coating and to partially immerse said abrasive particles therein, thence progressively cooling the so heated, coated substrate to temperature sufficiently low to solidify said brazing metal in the coating and permanently bond the same to said substrate and to partially embed and anchor said abrasive particles therein, said brazing metal having a melting point below said base metal and said abrasive particles, and said flux adhesive being selected from the group consisting of organic adhesives and soluble boron containing fluxing agents in volatile solvent.

3,854,899
AUTOMATIC MOLD CLEANING

Andrew Gerald Germain, Itasca; William George Dressel, Elk Grove Village, both of Ill., and Louis Sandor, Hammond, Ind., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed June 4, 1973, Ser. No. 367,355
Int. Cl. B24c *1/00*
U.S. Cl. 51—319 **7 Claims**

1. A method of removing a foreign material from the surface of a graphite mold, comprising the steps of: suspending a sand spray gun from a universal joint over the axis of the mold with the lower end of the gun spaced from the mold; then dropping sand through an inner gun passage and forcing air through an outer gun passage so that sand is forcefully ejected against the mold surface, while simultaneously moving the lower end of the gun in a spiral path toward the periphery

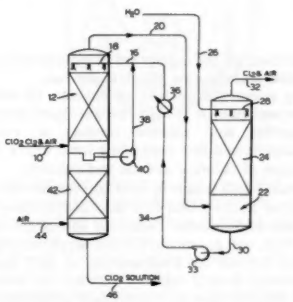


of the mold, the rate of speed of the circular component of said path being constant and the rate of speed of the radial component of said path being at a decreasing rate.

3,854,900
SEPARATION OF MIXTURES OF CHLORINE DIOXIDE AND CHLORINE

Guntars I. Upatnieks, and Gerald Cowley, both of Mississauga, Ontario, Canada, assignors to ERCO Industries Limited, Islington, Canada

Filed Nov. 20, 1973, Ser. No. 417,613
Int. Cl. B01d *55/14*
U.S. Cl. 55—51 **10 Claims**



1. A method for the separation of gaseous mixtures of chlorine dioxide and chlorine which comprises:

feeding a gaseous mixture containing chlorine dioxide and chlorine to a first contacting zone,

subjecting said gaseous mixture to countercurrent contact in said first contacting zone with an aqueous solution of chlorine dioxide and chlorine substantially saturated with respect to chlorine and having a temperature above that of said gaseous mixture to dissolve chlorine dioxide from said gaseous mixture in said aqueous solution,

recovering an aqueous solution of chlorine dioxide and chlorine having an increased proportion of chlorine dioxide from said first contacting zone,

passing the gaseous mixture having a decreased proportion of chlorine dioxide and an increased proportion of chlo-

rine resulting from said coutercurrent contact in said first contacting zone to a second contacting zone,

subjecting said latter gaseous mixture to counter-current contact with water to dissolve substantially all the chlorine dioxide and part only of the chlorine, from said latter gaseous mixture,

removing from said second contacting zone a gaseous material containing chlorine and being substantially free of chlorine dioxide,

removing from said contacting zone an aqueous solution of chlorine dioxide and chlorine, heating said latter aqueous solution to a temperature greater than that of said gaseous mixture and to the substantial saturation point of chlorine therein and

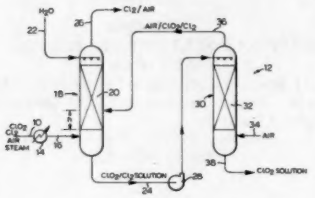
passing said heated solution to said first contacting zone as said aqueous solution countercurrently contacting said gaseous mixture.

3,854,901

SEPARATION OF GASEOUS MIXTURES OF CHLORINE DIOXIDE AND CHLORINE AND RECOVERY OF AQUEOUS SOLUTION OF CHLORINE DIOXIDE

Gerald Cowley, Mississauga, Ontario, Canada, assignor to ERCO Industries Limited, Islington, Ontario, Canada

Filed Nov. 20, 1973, Ser. No. 417,614
Int. Cl. B01d *53/14*
U.S. Cl. 55—51 **7 Claims**



1. A method for the separation of gaseous mixtures of chlorine dioxide and chlorine which comprises:

feeding a gaseous mixture of chlorine dioxide, chlorine, stean and an inert gas to a first gas-liquid contacting zone, subjecting said gaseous mixture to countercurrent contact in said first contacting zone with a first aqueous solution of chlorine dioxide and chlorine,

condensing said steam by said countercurrent contact and thereby heating said first aqueous solution of chlorine dioixde and chlorine, dissolving part of the chlorine dioxide from said gas mixture in said aqueous solution and the water formed by condensation of said steam, thereby providing second aqueous solution of chlorine dioxide and chlorine having an increased proportion of chlorine dioxide as compared to said first aqueous solution of chlorine dioxide and chlorine, and a first gaseous mixture of chlorine dioxide, chlorine and inert gas having a decreased proportion of chlorine dioxide as compared with said gaseous mixture of chlorine dioxide, chlorine, steam and inert gas,

removing said second aqueous solution of chlorine dioxide and chlorine from said first contacting zone,

passing said second aqueous solution of chlorine dioxide and chlorine to a second gas-liquid contacting zone, subjecting said second aqueous solution of chlorine dioxide and chlorine to countercurrent contact with an inert gas in said second contacting zone to remove chlorine and chlorine dioxide therefrom at a temperature greater than the temperature of said first contacting zone thereby forming a second gaseous mixture of chlorine dioxide, chlorine and inert gas and a third aqueous solution of chlorine dioxide and chlorine having a reduced proportion of chlorine as compared to that of the second aqueous solution of chlorine dioxide and chlorine, the quantity of chlorine dioxide removed exceeding the quantity of chlorine removed from said second aqueous solution of chlorine dioxide and chlorine,

removing the second gaseous mixture of chlorine dioxide chlorine and inert gas from said second gas-liquid contacting zone, mixing said second gaseous mixture of chlorine dioxide, chlorine and inert gas with said first gaseous mixture of chlorine dioxide, chlorine and inert gas,

the proportion of chlorine dioxide present in said first gaseous mixture and in said second gaseous mixture being substantially the same,

subjecting the resulting third gaseous mixture of chlorine dioxide, chlorine and inert gas to countercurrent contact with water in a third gas-liquid contacting zone to dissolve substantially all the chlorine dioxide and part of the chlorine from said third gaseous mixture thereby forming a fourth aqueous solution of chlorine dioxide and chlorine, and a gaseous mixture containing chlorine and an inert gas and being substantially free from chlorine dioxide,

passing said fourth aqueous solution of chlorine dioxide and chlorine from said third contacting zone to said first contacting zone as said first aqueous solution of chlorine dioxide and chlorine,

recovering said gaseous mixture of chlorine and inert gas from said third contacting zone, and

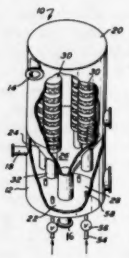
recovering said third aqueous solution of chlorine dioxide and chlorine from said second contacting zone.

3,854,902

METHOD OF FILTERING GAS

Bodo Kalen, Long Island, N.Y., assignor to The Ducon Company, Inc., Mineola, N.Y.

Division of Ser. No. 184,395, Sept. 28, 1971. This application Aug. 22, 1973, Ser. No. 390,669
Int. Cl. B01d *46/30*
U.S. Cl. 55—96 **8 Claims**



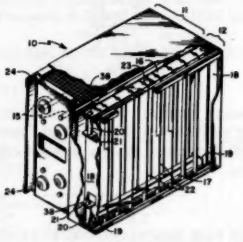
1. A method of filtering high temperature dirty gas comprising the steps of passing the dirty gas radially inwardly through discrete inlet screens coaxial with a center chamber to discrete superimposed annular filter chambers containing granular material occupying less than the total volume of the annular filter chambers so as to leave an unoccupied space at the top of each filter chamber, minimizing the effect of the angle of repose of the granular material by using horizontal filter beds whose radial width is between 1/5 and 1/6 of the outer diameter of the filter chambers, filtering out particulate from the dirty gas by passing the gas in an axial direction with respect to the filter chambers through the granular material, collecting the cleaned gas within the central chamber radially inwardly of the filter chambers, discharging the cleaned gas from the center chamber in an axial direction thereof, and backwashing said granular material in each filter chamber into the unoccupied space above each filter chamber by introducing pulses of high pressure air into said center chamber with

the high pressure air discharging through said screens, and preventing loss of the granular material by using screens having transverse dimensions which are less than the transverse dimensions of the granular material.

3,854,903
ELECTROSTATIC AIR CLEANER

Milos Tomaides, Brooklyn Park, Minn., assignor to Chemtool, Inc., Minnetonka, Minn.

Filed Mar. 6, 1973, Ser. No. 338,605
Int. Cl. B03c *3/12, 3/38, 3/41*
U.S. Cl. 55—147 **8 Claims**

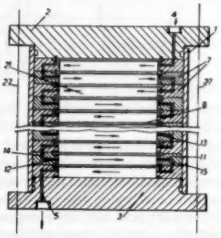


1. An ionizer assembly for an electrostatic air cleaning apparatus comprising first and second spaced ionization wire support members, said support members having a forward and a rear edge respectively with respect to airflow therebetween, a plurality of ionization wires extending between said first and second support members at the forward and at the rear edges thereof to define a plurality of couples of ionizer wires, said couples being generally aligned in the direction of airflow, grounded ionizer tubes forming an array of tubes upstream of and generally parallel to the upstream ionizer wires and a second array of grounded ionizer tubes downstream of and generally parallel to the downstream ionizer wires.

3,854,904
APPARATUS FOR SEPARATING FLUIDS

Bruno Jamet, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Nov. 23, 1973, Ser. No. 418,201
Claims priority, application France, Nov. 24, 1972, 72.41822
Int. Cl. B01d *53/22*
U.S. Cl. 55—158 **7 Claims**



1. Apparatus for separating fluids, such apparatus comprising, in combination:

a. a jacket;

b. two end walls, at least one of which is removable, defining with said jacket a chamber;

c. a stack of rings positioned within said chamber, said rings each having end faces abutting the end face of at least one adjacent ring in the stack and an internal annular face;

d. means defining a recess in at least one end face of a pair of abutting rings adjacent the annular face;

e. porous discs positioned in said recesses, whereby a compartment is defined within each ring by the annular wall and two adjacent porous discs;

f. a membrane lining opposite faces of each disc;

g. a first passage in each ring providing communication between one end face of the ring and the internal annular face of the ring;

h. a second passage in each ring, providing communication between the other end face of the ring and the internal annular face of the ring, the second passage opening onto the internal face at a point generally opposite to the point at which the first passage opens thereonto, the first passage of each ring communicating with the second passage of the adjacent ring;

i. a fluid inlet duct in one end wall communicating with the first passage of the ring at the adjacent end of the stack;

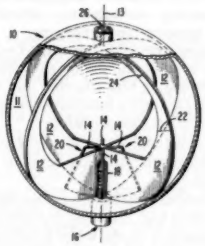
j. a fluid outlet duct in the other end wall communicating with the second passage of the ring at the other end of the stack; and

k. means for removing fluid which has passed through the membranes into each porous disc.

3,854,905
STORAGE SYSTEM FOR TWO PHASE FLUIDS

Daniel Lee Balzer, Hamilton Square, and Ralph Jones Lake, Jr., Cranbury, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1972, Ser. No. 246,525
Int. Cl. B01d *53/00*
U.S. Cl. 55—159 **13 Claims**



1. A storage apparatus for providing a selected one of two fluids from the storage apparatus continuously on demand until the selected fluid is substantially depleted, said selected fluid being a liquid, comprising:

a closed storage container having an inner surface;

a first opening for admitting fluids into said container;

a second opening for withdrawing said selected fluid from said container; and

means for providing a continuous flow path of said selected fluid to said second opening,

said means including a generally planar elongated member in said container disposed adjacent said inner surface and extending toward said second opening,

said member being positioned along said inner surface to form a corner with a portion of the surface of said member and a portion of the inner surface to support a flow path of fillets of liquid as liquid in said container is depleted,

said inner surface and the surface of said member being formed of a material that is preferentially wetted by said selected fluid whereby said flow path only of said selected fluid is continuously maintained to said second opening as said selected liquid is depleted from said apparatus, said selected fluid flowing to said second opening along a fillet

path formed by capillary action in said corner of said member and said inner surface,

the respective densities of said two fluids being selected such that the flow of said selected fluid is substantially independent of body forces on said apparatus subjected to acceleration fields.

3,854,906

DEVICE FOR VENTING AND AERATING CLOSED CIRCULATORY WATER FLOW SYSTEMS

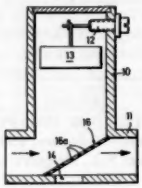
Franciscus Roffelsen, NL-Helmond, Netherlands, assignor to N.V. Spiro Research, Helmond, Netherlands

Filed Jan. 8, 1973, Ser. No. 321,970

Claims priority, application Germany, Dec. 9, 1972, 2260349; Jan. 8, 1972, 2200904

Int. Cl. B01d *19/00*

U.S. Cl. 55—159 **17 Claims**



1. In combination with a horizontally extending conduit of a closed flow system, wherein water of fluctuating temperature is pumped and circulated through conduit means and the system is operatively connected to a pressurized water source, a venting and aerating tap comprising:

a. a vent casing extending upwardly from said horizontally extending conduit and defining a collecting chamber;

b. means connecting said chamber and the flow passage of said conduit to form a junction between said conduit flow passage and said casing chamber;

c. a vent valve arranged on said casing and being capable of establishing communication between said chamber and the outside;

d. a float member operatively connected to said valve and located within said chamber and opening and closing the valve in response to the water level in said chamber; and

e. a grid positioned in said junction and extending over at least a portion of the cross-sectional area of said flow passage, said grid being formed from rod or wire means which, as distinguished from fine-mesh sieves, define comparatively large size gaps.

3,854,907

VENTED FILTER HOLDER

Donald B. Rising, Stow, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Dec. 10, 1973, Ser. No. 424,602

Int. Cl. B01d *19/00, 23/00*

U.S. Cl. 55—159 **11 Claims**

1. A vented filter holder comprising, in combination:

1. a hollow tubular support member having means forming a filter underdrain support on its surface, said support member including an opening to the interior thereof;

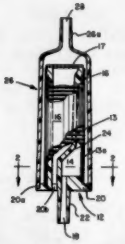
2. a sheet of liquid-wettable filter material supported on the underdrain support formed on the outer surface of said tubular support member;

3. means forming a liquid outlet port;

4. means providing a first closed fluid path from said underdrain support to said outlet port;

5. a non-liquid wettable filter material sealed across the opening to the interior of said hollow support member;

6. means forming a fluid passage from the interior of said support member through said support member to the exterior of said filter holder, said passage being separated from said first closed passage; and



7. cover means, including means forming an inlet port surrounding said support member and filter and sealed to said support member along a line but otherwise spaced therefrom.

3,854,908

APPARATUS FOR DISCHARGING FLUE GASES FROM BLAST FURNACES AND THE LIKE

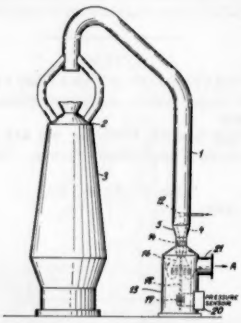
Gerhard Hausberg, Essen-Bredeney, and Karl-Rudolf Hegemann, Essen-Bergerhausen, both of Germany, assignors to Gottfried Bischoff Bau kompl. Gasreinigungs- und Wasserruckkuhlanlagen Kommanditgesellschaft, Essen, Germany

Continuation-in-part of Ser. No. 235,208, March 15, 1972,. This application Mar. 28, 1973, Ser. No. 345,762

Claims priority, application Germany, Mar. 16, 1971, 2112541; May 11, 1971, 2123338; Mar. 30, 1972, 2215565

Int. Cl. B01d *47/06*

U.S. Cl. 55—210 **9 Claims**



1. An apparatus for depressurizing high-pressure waste gases, comprising:

a separating compartment provided with an exit port;

a duct having an inlet connected to a source of waste gases to be depressurized, said duct terminating in a nozzle with a first section converging toward an outlet which opens into said compartment and an elongated second section of substantially constant cross-section between said first section and said outlet;

an insert extending coaxially with all-around clearance into said nozzle from said compartment, said insert having a tapering portion with a wider upstream end and a narrower downstream end defining with said first section a regulating gap of a width depending upon the relative axial position of said insert and said nozzle, said insert further having a substantially straight part axially adjoining said narrower downstream end of said tapering por-

tion and defining with said second section a restricted passage of substantially constant width exerting upon said gases a throttling effect substantially independent of said axial position;

turbulence-generating means surrounding said insert straight section downstream of said gap; and

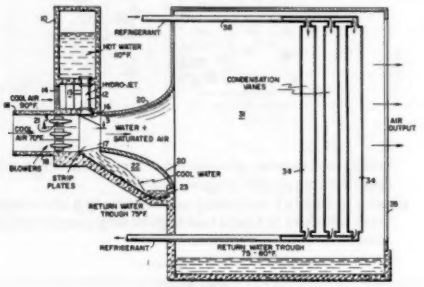
control means for varying said relative axial position, said turbulence-generating means comprising a perforated barrier with several levels of relatively offset perforations in said passage.

3,854,909

HEAT EXCHANGER FOR POWER PLANTS

Perry M. Hoisington, Coral Gables, Fla., and Austin G. Boldridge, Jr., Freehold, N.J., assignors to HB2 Inc., New York, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,700
Int. Cl. F28c *3/08*
U.S. Cl. 55—241 **12 Claims**



1. A heat exchanger for disposing of the heat present in water derived from a power plant condenser comprising: a hydrojet mixer for mixing the hot water from the condenser with ambient air to produce an emulsion-like mixture and for saturating the air in the mixture; a separation chamber adjoining the mixer for separating the water from the air in said mixture, said chamber including a set of strip plates for collecting the water in said mixture and for diverting it to a recycling trough, and a set of blowers for applying a stream of ambient air to the plates and for blowing saturated air from the chamber; and a condensation chamber including a plurality of refrigerated vanes for receiving the saturated air and for condensing the water in the air, a return water trough for collecting the water from the vanes for recycling in the condenser, and an exit port for directing the cooled and dehumidified air into the atmosphere.

3,854,910

APPARATUS FOR REMOVING PARTICLES FROM AN AIRSTREAM

Peter A. Hammerquist, 3419 S.W. Knollwood, Corvallis, Oreg. 97330

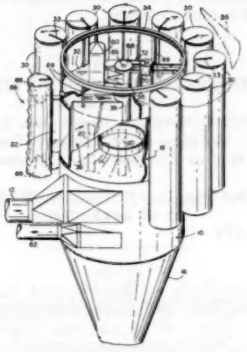
Filed Sept. 21, 1972, Ser. No. 290,798
Int. Cl. B01d *46/04, 50/00*
U.S. Cl. 55—287 **18 Claims**

1. An apparatus for removing fine dust particles from an airstream, said apparatus comprising:

a substantially continuously operating funnel shaped centrifugal dust collector mounted at an exterior building location and initially receiving said airstream, and including fan means for forcing air through said centrifugal dust collector, said centrifugal dust collector also having an outlet,

a plurality of bags each having an opening, said bags being pervious but closed except for said openings and through which a flow of air passes,

a vertical, substantially cylindrical chamber having a long cylindrical wall, and said chamber having chamber openings, means individually connecting the openings of said bags to said chamber openings, said chamber having an entrance, coupling means providing a connection between the outlet of said centrifugal dust collector and said entrance of said chamber for receiving said airstream from the outlet of said centrifugal dust collector into said chamber so that said airstream passes through said chamber, through said bag openings via said chamber openings, into said bags, and through said bags to atmospheric pressure, with said chamber and bags being located in an environment for exposing said bags to said atmospheric



pressure, said bags being supported from said chamber and being inflated from within by air blown thereinto by air pressure provided by said fan means,

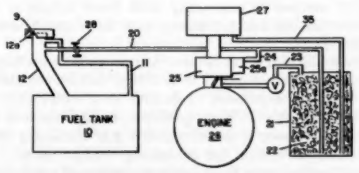
said bags being elongated and supported in circular vertical array comprising a circle of bags disposed around and substantially surrounding the cylindrical side wall of said cylindrical chamber where the bags receive the airstream from said chamber, said chamber being provided with a rotatable hollow sweep arm adapted for making successive connection with said bags via said chamber openings, and said sweep arm having means for providing a suction relative to atmosheric pressure for reversing air flow and withdrawing dust from the bag to which the hollow sweep arm connects.

3,854,911

PRESSURE FUEL TANK EVAPORATION CONTROL

Brooks Walker, 1280 Columbas Ave., San Francisco, Calif. 94133

Filed Apr. 13, 1971, Ser. No. 133,537
Int. Cl. B01d *53/00*
U.S. Cl. 55—387 **7 Claims**



1. In a fuel system of an internal combustion engine for capturing the vapors normally escaping from a tank containing vaporizable fuel when the tank is opened,

said tank having a filler neck extending upwardly from the upper end of the tank and open at its free end for entry of fuel to refill the tank,

a cap for sealing the open end of the filler neck against the escape of vapor under pressure generated by the fuel in the tank,

a container having means therein for absorbing said vapors when directed thereinto,

means forming with a portion of the neck a passageway leading from the interior of the tank to the interior of the container.

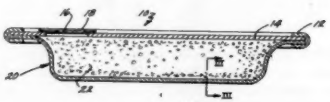
Manually movable valve means alternately movable, while the cap seals the filler neck opening, to block said passageway for permitting build-up of vapor pressure in the tank and for unblocking said passageway to release any vapor pressure in excess of atmospheric pressure from said tank to said container.

3,854,912

COMBINED GREASE TRAP AND AIR FILTER FOR RANGE HOODS

Gordon R. Terrel; Robert T. Hause; Alex J. Hancox, and Fredrick J. McCulley, all of Kitchener, Ontario, Canada, assignors to Lau Products, Ltd., Kitchener, Ontario, Canada

Filed Sept. 11, 1972, Ser. No. 287,681
Int. Cl. B01d *50/00*
U.S. Cl. 55—479 **12 Claims**



1. A combination grease trap and air filter, comprising: a perforate grease trap structure having apertured layers sandwiched together such that the apertures in different ones of said layers are non-aligned to thereby define a plurality of at least partially obstructed air passages therethrough, said grease trap structure being of a dished configuration formed of said sandwiched layers and having a predetermined depth and having side and bottom portions defining a receptacle; and a layer of air filtration media disposed and retained within said receptacle.

3,854,913

RECOVERY OF NEON AND HELIUM FROM AIR BY ADSORPTION AND CLOSED CYCLE HELIUM REFRIGERATION

Evgueni Iliev Leyarovski; Borislav Vassilev Nicolov, and Yordan Krestev Gueorguiev, all of Sofia, Bulgaria, assignors to Physicheski Institute s Aneb pri Ban, Sofia, Bulgaria

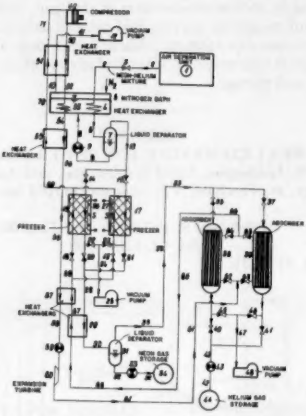
Filed Jan. 27, 1972, Ser. No. 221,265
Claims priority, application Bulgaria, Feb. 25, 1971, 1600171
Int. Cl. F25j *5/00*
U.S. Cl. 62—12 **2 Claims**

1. A method of separating neon from helium in a neon-helium mixture and producing pure neon and helium, comprising the steps of:

a. cooling said neon-helium mixture by heat exchange with cold helium formed in a closed helium-circulating bycycle by expansion of helium to a temperature below substantially 25°K to condense neon from said mixture and produce a noncondensed gas consisting predominantly of helium but containing residual neon;

b. adsorbing neon from said noncondensed gas in a molecular sieve adsorber at a temperature between 5.2°K and 22°K to remove said residual neon;

c. desorbing neon from said adsorber under vacuum while cooling at a temperature below 22°K said gas to said temperature between 22°K and the critical temperature point of helium at least in part by abstracting from said gas all of the latent heat of desorption of the neon, said mixture prior to step (a) containing at least one high-



boiling component selected from the group which consists of nitrogen and oxygen; and

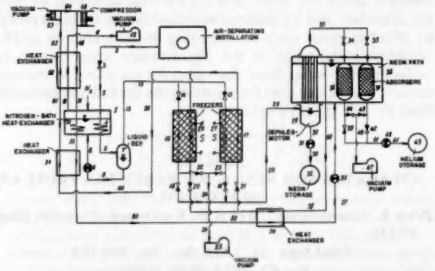
d. prior to step (a), subjecting said mixture to a low temperature sufficient to freeze said high-boiling component and remove it from said mixture.

3,854,914

RECOVERY OF NEON AND HELIUM FROM AIR BY ADSORPTION AND CLOSED CYCLE NEON REFRIGERATION

Evgueni Iliev Leyarovski; Borisiav Vassilev Nicolov, and Yordan Krestev Gueorguiev, all of Sofia, Bulgaria, assignors to Physicheski Institute s Aneb pri Ban, Sofia, Bulgaria

Filed Jan. 27, 1972, Ser. No. 221,260
Claims priority, application Bulgaria, Feb. 25, 1971, 16000
Int. Cl. F25j *5/00*
U.S. Cl. 62—12 **2 Claims**



1. A method of obtaining neon and helium from the air, comprising the steps of:

a. separating nitrogen and oxygen from the air and producing a neon and helium gas mixture;

b. cooling said neon and helium gas mixture by heat exchange with a circulating neon coolant in a closed auxiliary cooling cycle, thereby condensing neon with absorbed hydrogen from said mixture while producing a helium-rich gas containing neon and hydrogen;

c. passing said helium-rich gas through an adsorbent retaining neon and hydrogen and recovering substantially pure helium continuously therefrom;

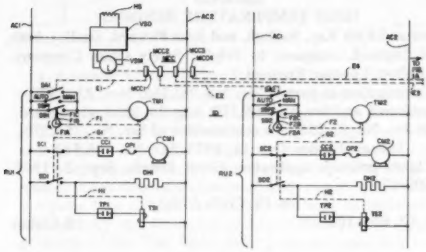
d. desorbing neon and hydrogen from said adsorbent while using the latent heat of desorption to partly cool said gas mixture;
e. throttling the condensed neon with absorbed hydrogen to atmospheric pressure thereby forming hydrogen vapor and discharging the same; and
f. removing hydrogen from the neon and helium subsequent to step (a) but prior to the recovery of pure helium in step (c).

3,854,915

DEMAND DEFROST CONTROL SYSTEM

Karl J. Schulze-Berge, Manitowoc, and John Joseph Allard, Mishicot, both of Wis., assignors to AMF Incorporated, White Plains, N.Y.

Filed Apr. 10, 1973, Ser. No. 349,690
Int. Cl. F25d *21/06*
U.S. Cl. 62—155 **48 Claims**



1. Means controlling defrost cycles of at least one refrigeration unit having defrost and refrigeration means in response to the demand constraint of an ambient parameter, comprising:
transducer means sensing said ambient parameter and providing a variable speed drive output as a function thereof;
control means driven by said drive output;
constant speed drive means;
first means responsive to said control means energizing said constant speed drive means for a first predetermined interval;
second means responsive to said constant speed drive means maintaining the latter energized for a second predetermined interval; and
third means responsive to said constant speed drive means actuating said defrost means and precluding actuation of said refrigeration means for a third predetermined interval.

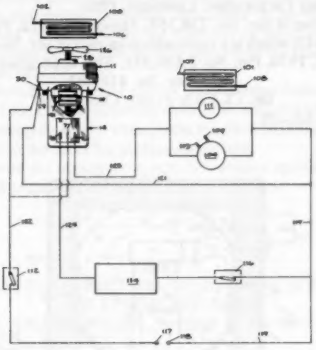
3,854,916

SYSTEM USING MOTOR DRIVEN CONTROL DEVICE

Richard W. Dochterman, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 223,916, Feb. 7, 1972, Pat. No. 3,743,872. This application June 29, 1973, Ser. No. 374,970
Int. Cl. F25d *17/00*
U.S. Cl. 62—180 **3 Claims**

1. A refrigeration system including refrigeration heat transfer means comprising condenser and evaporator coils, a motor driven compressor interconnected with the condenser and evaporator coils, an electric fan motor drivingly coupled with fan means for forcing air past at least some of the coils, and a control device including switching means for selectively providing excitation voltage for the compressor motor; said fan motor including a magnetic power output member and said control device including a magnetic power input member, said fan motor and control device being magnetically coupled through the output and input members so that the control device is driven by the fan motor during normal operation of the system and so that fan motor operation is not adversely



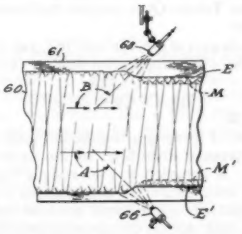
affected during excitation of the compressor motor by malfunctions of the control device.

3,854,917

METHOD OF AND APPARATUS FOR PROCESSING FLEXIBLE SHEET MATERIAL

C. Daniel McKinney, Anderson, and Forrest C. Vickery, Williamston, both of S.C., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 16, 1972, Ser. No. 298,069
Int. Cl. C03b *37/02*; **C03c** *27/10*; **B32b** *17/04*
U.S. Cl. 65—3 **9 Claims**



1. The method of producing a sheet-like body of glass strand comprising:
forming on a surface a sheet-like fibrous body capable of being folded without fold lines including glass strands disposed in strips oriented in overlapping relation back and forth across the body with the strands in each of the strips disposed in generally parallel and closely positioned courses and loops of the strands extending laterally across a substantial portion of the strip in interleaving relation with loops of other strands of the same strip advancing the surface along a linear generally horizontal path; and
directing a single stream of gaseous fluid against a marginal region of the sheet-like body from an outlet located in a position above and outwardly of the marginal region such that the stream is directed obliquely downwardly and inwardly of the fibrous body in a direction generally opposed to the direction of advancement of the surface to effectively move the body in such region into underlying folded relation to form an edge.

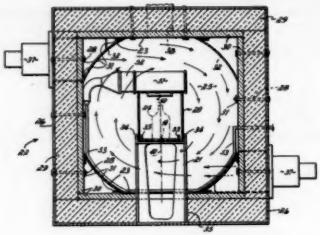
3,854,918
METHOD FOR CONTINUOUS HEAT TREATING OF GLASS ARTICLES

Richard G. McKinstry, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 238,355, March 27, 1972, Pat. No. 3,807,943, which is a continuation-in-part of Ser. No. 62,489, Aug. 10, 1970, Pat. No. 3,659,551. This application Nov. 19, 1973, Ser. No. 416,983

Int. Cl. C03c *21/00*; C03b *25/04*

U.S. Cl. 65—30 5 Claims



1. A method of treating glass articles comprising,

placing the articles in lineal arrangement on a conveyor,

moving the conveyor in the horizontal direction, with the articles on it, through an open ended muffle while heating at least a portion of said muffle,

said heating being carried out by directing hot gasses tangentially to the exterior of said muffle and causing said gasses to flow in the longitudinal direction as a helix around the outside of said muffle.

3,854,919
METHOD OF FORMING TRANSPARENT GLASS CERAMIC WITH COMPRESSION LAYER

Perry P. Pirooz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 165,744, July 23, 1971, Pat. No. 3,779,856. This application Mar. 1, 1973, Ser. No. 337,223

Int. Cl. C03b *29/00*

U.S. Cl. 65—32 11 Claims

1. A method of forming a transparent glass ceramic body having a compressive stress layer on the surface thereof and whereby there is imparted to said body a high mechanical strength of at least 20,000 psi and whereby said body when broken will shatter into very small particles instead of large, jagged pieces, said method consisting essentially of

a. subjecting a thermally crystallizable glass body consisting essentially of the following composition:

Ingredient	Weight Percent
SiO_2	54 – 78
Al_2O_3	18 – 28
Li_2O	2 – 6.4
Nucleating Agent	3 – 8
Copper Oxide (as Cuo)	0.5 – 6

wherein the molar ratio of SiO_2/Al_2O_3 is from 3 to 6, the molar ratio of Li_2O/Al_2O_3 is from 0.3 to about 0.9 and the nucleating agent is selected from the group consisting of TiO_2, ZrO_2 and mixture thereof and if TiO_2 or ZrO_2 is the sole nucleating agent it is present in an amount of from 3 to 6 percent and wherein at least 90 percent by weight of said body consists of said SiO_2, Al_2O_3, Li_2O, CuO and nucleating agent, to the nucleating temperature for said glass.

b. maintaining said glass body in a reducing atmosphere while subjecting it to said nucleating temperature for a period of time sufficient to increase the rate of nucleation in the surface of said glass body and said body has a higher degree of nucleation in its surface than in the interior thereof, and then

c. further subjecting said glass body to a temperature sufficient to crystallize said body to a glass-ceramic having a higher degree of crystallization in and below the surface of the body than in the interior of said body, the portion of said glass ceramic body having a higher degree of crystallinity forming a compressive stress layer on the surface of said glass-ceramic body, to a depth of at least about 100 microns on the surface of said body

said glass ceramic body having a coefficient of thermal expansion of from about +12 to −12 $\times 10^{-7}$/°C. (0°–300°C) said expansion coefficient being lower than that of the expansion coefficient of said glass body by 20 $\times 10^{-7}$/°C.

3,854,920
HIGH TEMPERATURE BENDING

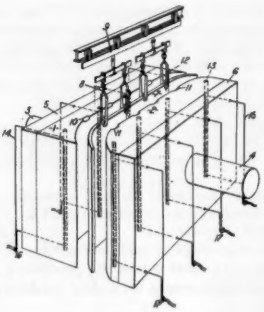
Soloman Elijah Kay, Solihull, and John Pickard, Studley, both of England assignors to Triplex Safety Glass Company, Limited, London, England

Continuation-in-part of Ser. Nos. 92,255, Nov. 23, 1970, abandoned, and Ser. No. 755,270, Aug. 26, 1968, abandoned, said Ser. No. 92,255, is a continuation of Ser. No. 755,270,. This application Oct. 11, 1973, Ser. No. 405,543

Claims priority, application Great Britain, Sept. 5, 1967, 40600/67

Int. Cl. C03b *23/02*

U.S. Cl. 65—106 18 Claims



1. A method of manufacturing a curved glass sheet which comprises the steps of:

a. heating a glass sheet substantially to a selected temperature within the bending temperature range of the glass;

b. heating complementary bending surfaces to said selected bending temperature;

c. applying the bending surfaces while heated to the temperature of step (b) to the opposite side surfaces of the glass sheet heated to the temperature of step (a) to conform the sheet to the curvature of said bending surfaces;

d. continuing step (c) for a time sufficient to consolidate the shape of the sheet at said curvature and to establish a thermal condition of the sheet at the temperature of said bending surfaces to assure close retention of said curvature on withdrawal of the bending surfaces from both surfaces of the glass sheet;

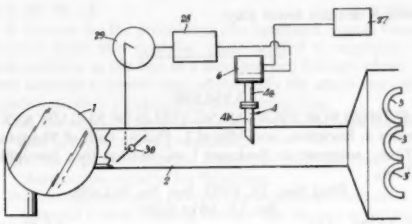
e. withdrawing said bending surfaces from both surfaces of the glass sheet at the end of said time, and then

f. uniformly cooling both surfaces of the curved sheet from the thermal condition established by step (d).

3,854,921
GLASS MOLD COOLING SYSTEMS

Stanley Peter Jones, Doncaster, England, assignor to Emhart Corporation, Bloomfield, Conn.

Filed Sept. 4, 1973, Ser. No. 394,218
Claims priority, application Great Britain, Sept. 5, 1972, 41121/72
Int. Cl. C03b *9/38*
U.S. Cl. 65—161 **7 Claims**

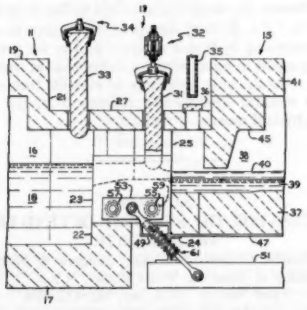


1. A system for controlling the rate of cooling of a first body to which heat is supplied during a manufacturing process, the system comprising means for generating a flow of cooling air to pass over a surface of the first body during the process, a second body which has similar cooling characteristics to the first body, means for causing a portion of said cooling air to pass over a surface of said second body, means for maintaining a regular flow of heat to said second body to maintain said second body at a temperature near a desired operating temperature of the first body during the process, and control means dependent upon the temperature of said second body for so controlling said means for generating the flow of air as to compensate for fluctuations in temperature of said second body, whereby the rate at which the cooling air cools the first body is maintained substantially constant.

3,854,922
THRESHOLD MOUNTED IN A MOLTEN GLASS DELIVERY APPARATUS

John E. Sensi, Arnold, and George O. Wehner, Bethel Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 27, 1974, Ser. No. 455,429
Int. Cl. C03o *18/02*
U.S. Cl. 65—172 **11 Claims**



1. In a glass forming apparatus comprising a chamber having an inlet end and an outlet end and including a bottom for containing a pool of molten metal, a top roof portion for enclosing a space extending above the pool of molten metal, a lift-off assembly in the outlet end of the glass forming chamber for removing a continuous sheet of glass from the chamber, means for sealing the enclosed chamber from the outside environment and means at the inlet end of the glass forming chamber for connecting the glass forming chamber to a glass-making furnace for delivering molten glass therefrom to the glass forming chamber, the improvement comprising:

a. an impervious structure connected to an impervious casing extending from the inlet end of the glass forming chamber beneath the bottom portion of the glass forming chamber;

b. a threshold member resting on the impervious structure and disposed transversely across the inlet end of the glass forming chamber, wherein the threshold member extends above the level for molten metal; and

c. means for urging the threshold member against the bottom portion of the glass forming chamber.

3,854,923
PROCESS FOR PRODUCING AMMONIACAL SOLUTIONS OF ZINC ALKANOATES

Louis E. Ott, St. John, Ind., assignor to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 198,963, Nov. 15, 1971, abandoned. This application Oct. 5, 1973, Ser. No. 404,366
Int. Cl. C05d *9/02*
U.S. Cl. 71—1 **3 Claims**

1. The method of preparing a liquid zinc micronutrient composition consisting of an aqueous ammoniacal ionic solution of a zinc alkanoate containing at least two mols of $C_{1\text{-}6}$ alkanoic acid anion per mol of zinc, at least about 4 mols of ammonia per mol of zinc, and at least 10 weight percent of water which comprises reacting zinc oxide, in an amount sufficient to provide from about 5 to about 15 weight percent zinc in said composition, with an ammonia-basic aqueous ammonium alkanoate solution consisting of at least two mols of $C_{1\text{-}6}$ alkanoic acid anion per mol of zinc, at least 4 mols of ammonia per mol of zinc provided by zinc oxide, and at least 10 weight percent water.

3,854,924
1,3,4-THIADIAZINE HERBICIDES

William C. Doyle, Jr., Leawood, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 103,814, Jan. 4, 1971, Pat. No. 3,779,736. This application May 17, 1973, Ser. No. 361,366
Int. Cl. A01n *9/12*
U.S. Cl. 71—90 **1 Claim**

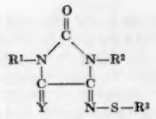
1. The method of combating undesired vegetation comprising applying to the locus of the undesired vegetation a herbicidally effective amount of methyl N-(5-tert.butyl-6H-1,3,4-thiadiazin-2-yl)-N-methylcarbamate.

3,854,925
1,3-DISUBSTITUTED-5-(SUBSTITUTED THIO) IMINO-2,4-IMIDAZOLIDINE DIONES AND THE 4-THIO ANALOGS

Malcolm Scott Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 142,756, May 12, 1971, Pat. No. 3,766,202, which is a continuation-in-part of Ser. No. 56,899, July 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 852,509, Aug. 22, 1961, Pat. No. 3,655,689, which is a continuation-in-part of Ser. No. 745,417, July 17, 1968, abandoned. This application July 5, 1973, Ser. No. 376,870
Int. Cl. A01n *9/22*
U.S. Cl. 71—92 **25 Claims**

1. A method for post-emergent control of undesirable vegetation which comprises applying to said vegetation an herbicidally effective amount of a compound of the formula



wherein Y and O or S; R^1 and R^2 are individually alkyl of 1 to 10 carbon atoms substituted with 0 to 6 halogens of atomic number 9 to 35, alkenyl of 2 to 10 carbon atoms substituted with 0 to 6 halogens of atomic number 9 to 35, propargyl or cycloalkyl of 3 to 10 carbon atoms substituted with 0 to 6 halogens of atomic number 9 to 35, or phenyl substituted with 0 to 5 halogens of atomic number 9 to 35, 0 to 5 nitro groups, 0 to 5 alkoxy groups individually of 1 to 4 carbon atoms or 0 to 5 alkyl groups individually of 1 to 4 carbon atoms, or 0 to 1 trichloromethyl; and R^3 is alkyl of 1 to 6 carbon atoms susbtituted with 0 to 6 halogen atoms of atomic number 9 to 35, alkenyl of 2 to 6 carbon atoms substituted with 0 to 6 halogen atoms of atomic number 9 to 35, or phenyl substituted with 0 to 5 halogen atoms of atomic number 9 to 35 or alkyl groups of 1 to 4 carbon atoms.

3,854,926

METHOD OF CONTROLLING UNDESIRED VEGETATION WITH 2H-PYRIDO (3,2-B)--1,4-OXAZIN-3(4H) ONES

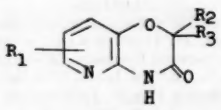
Herman O. Senkbeil, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed June 4, 1973, Ser. No. 366,896

Int. Cl. A01n *9/22*

U.S. Cl. 71—94 **12 Claims**

1. The method of controlling undesired plants which comprises applying to the locus of seeds of undesired plants a herbicidally-effective amount of a compound corresponding to the formula:



wherein R_1 is hydrogen, methyl or halo, and R_2 and R_3 each independently represent hydrogen or a lower alkyl group of from 1 to 3 carbon atoms.

3,854,927

PROCESS FOR CONTROLLING THE GROWTH OF UNWANTED PLANTS

Karl Kiehs; Karl-Heinz Koenig, both of Ludwigshafen, and Adolf Fischer, Mutterstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/Rhein, Germany

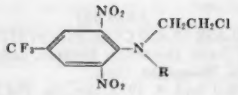
Continuation-in-part of Ser. No. 92,190, Nov. 23, 1970, abandoned, which is a division of Ser. No. 784,247, Dec. 16, 1968, Pat. No. 3,681,425. This application May 11, 1973, Ser. No. 359,242

Claims priority, application Germany, Dec. 21, 1967, 1643719

Int. Cl. A01n *9/20*

U.S. Cl. 71—121 **2 Claims**

1. A process for controlling the growth of unwanted plants in crops wherein the soil in which the growth of the unwanted plants is to be prevented is treated with a phytotoxic quantity of a compound having the formula



where R denotes lower alkyl.

3,854,928

METHOD FOR INCREASING YIELD OF SUGARCANE

Stanley J. Buckman, and Miguel L. Pulido, both of Memphis, Tenn., assignors to Buckman Laboratories, Inc., Memphis, Tenn.

Filed Nov. 14, 1973, Ser. No. 415,698

Int. Cl. A01n *9/20*

U.S. Cl. 71—121 **5 Claims**

1. A method of increasing the sucrose content of growing sugarcane comprising applying to the foliage of the sugarcane plant prior to harvest, an effective amount of the compound poly[oxyethylene(dimethyliminio)ethylene-(dimethyliminio)ethylene dichloride].

3,854,929

PROCESS OF BENEFICIATING TITANIFEROUS ORES IN THE PRESENCE OF HYDROGEN CHLORIDE

Donald Fergusson Stewart, Doncaster, and Leslie John Pollard, Lower Templestowe, both of Australia, assignors to ICI Australia Limited, Melbourne, Victoria, Australia

Continuation-in-part of Ser. No. 242,804, April 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 228,315, Feb. 22, 1972,. This application Mar. 22, 1973, Ser. No. 343,664

Claims priority, application Australia, Mar. 1, 1971, 4156/71; Mar. 1, 1971, 4157/71; Mar. 1, 1971, 4158/71; Mar. 1, 1971, 4159/71

Int. Cl. C21b *1/00*; **C01g** *23/04*

U.S. Cl. 75—1 **22 Claims**

1. A process for producing metallic iron concentrates and titanium oxide concentrates from titaniferous ores which process comprises adding a flux to the ore to form a reaction mixture wherein the weight ratio of ore to flux is in the range from 5:1 to 1,2:1, heating the reaction mixture in an atmosphere comprising hydrogen chloride and in the presence of a reducing agent to a temperature below that at which a slag is formed so as to cause formation of metallic iron and separating the metallic iron formed thereby from the titanium oxide by physical means.

3,854,930

PROCESS FOR THE REMOVAL OF LEAD FROM MOLYBDENITE

Dan M. Kentro, Greenwich, Conn., assignor to Molybdenum Corporation of America, White Plains, N.Y.

Filed Nov. 5, 1973, Ser. No. 412,584

Int. Cl. C22b *1/00*, *49/00*

U.S. Cl. 75—1 **5 Claims**

1. The process for reducing the lead content of molybdenite concentrate which comprises heating the concentrate at a temperature between about 150°–450° C for a period of about ½ to 3 hours with from about .5–30 percent by weight of ammonium chloride, and leaching the treated concentrate with hydrochloric or nitric acid to convert lead in the concentrate to a soluble lead compound.

3,854,931

ROASTING, COARSENING AND HARDENING OF IRON SULFIDE MATERIALS

Karl Goran Gorling, Lidingo, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 135,116, April 19, 1971, abandoned.
This application Feb. 20, 1973, Ser. No. 333,480
Claims priority, application Sweden, Apr. 20, 1970, 5391/70
Int. Cl. C20b 1/10
U.S. Cl. 75—3 5 Claims

1. Process for the production of a hardened, coarse roasted product from iron sulphide, characterized in supplying the iron sulphide to the bed of a fluidized bed furnace where the iron sulphide is roasted and substantially the whole amount of roasted goods is entrained by the roasting gas,

that the roasted fine grained product is separated from the gas in a gas cleaning apparatus,

that the separated material is agglomerated to a particle size distribution suitable for fluidizing,

that the agglomerates formed in a substantially dry state are charged to said roasting furnace and therein subjected to hardening and further roasting under influence by the heat developed at said roasting of the iron sulphide at a temperature of between 600° and 1,100° C, and

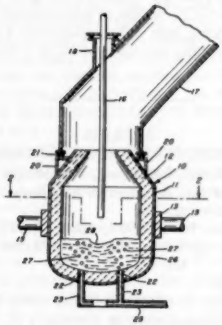
that the hardened roasted and substantially sulphur-free agglomerates are removed from the bed.

3,854,932

PROCESS FOR PRODUCTION OF STAINLESS STEEL

Harry L. Bishop, Jr., Pittsburgh, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed June 18, 1973, Ser. No. 370,904
Int. Cl. C21c 5/34, 7/10
U.S. Cl. 75—60 13 Claims



1. A process for producing stainless steel comprising:

A. providing a charge that is a least partly liquid and suitable for producing a chromium-containing stainless steel in an oxygen steel converter having a tuyere in its bottom section,

B. introducing oxygen through a lance onto or beneath the surface of said charge,

C. introducing an inert gas or an endothermic gas through said tuyere,

D. maintaining a subatmospheric pressure in said converter, and

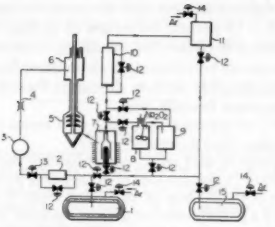
E. recovering a stainless steel product.

3,854,933

METHOD OF PURIFYING SODIUM METAL

Kazuo Furukawa; Yoshio Kato; Hideo Ohno, and Hiroji Katsuta, all of Ibaragi-ken, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed June 28, 1971, Ser. No. 157,547
Claims priority, application Japan, June 29, 1970, 45-55942
Int. Cl. C22b 27/00
U.S. Cl. 75—66 5 Claims



1. A method of purifying sodium metal used as nuclear reactor coolant and contaminated with damaged nuclear fuel and nuclear fission products comprising elements selected from the group consisting of O, N, S, Sr, Ba, Sb, Sm, Pr, La, Ce, Ni, Si, Sn, Zn, Tl, Th, Pu, Rh, and Pb which comprises dissolving at least one species of metallic additives selected from the group consisting of calcium, magnesium or an alloy thereof in molten contaminated sodium at a temperature of about 450°–850° C and cooling the molten mixture to a temperature a little higher than the melting point of sodium metal to separate the metallic additives and the impurities chemically bonded therewith, dissolved, occluded or absorbed therein.

3,854,934

PURIFICATION OF MOLTEN ALUMINUM AND ALLOYS

James E. Dore, Milford; Peter E. Sevier, Woodbridge, and John C. Yarwood, Madison, all of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed June 18, 1973, Ser. No. 371,127
Int. Cl. C22b 21/06
U.S. Cl. 75—68 R 22 Claims

1. A process for purifying aluminum base alloys by removing gaseous and solid particulate impurities therefrom which comprises: providing a molten aluminum base alloy containing gaseous and solid particulate impurities therein; providing over said molten alloy a supernatant layer of a molten mixture of at least two halide salts, wherein the cation is selected from the group consisting of an alkali metal and an alkaline earth metal, bubbling a treating gas through said molten alloy, said gas consisting essentially of an inert carrier gas and an effective amount of a fully halogenated lower hydrocarbon containing one to six carbon atoms, which is free of hydrogen and contains at least one fluorine atom, said gas containing up to 10 percent by volume of said hydrocarbon, thereby transferring solid particulate impurities to the supernatant layer and removing gaseous impurities therefrom; and separating the said alloy in purified condition.

3,854,935

GRAIN REFINING COMPOSITIONS AND METHOD OF REFINING ALUMINUM THEREWITH

George Snow, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Continuation-in-part of Ser. No. 359,756, May 14, 1973, abandoned. This application Aug. 9, 1973, Ser. No. 386,880
Claims priority, application Great Britain, May 17, 1972, 23219/72; Aug. 8, 1972, 36979/72
Int. Cl. C22b *21/06*
U.S. Cl. 75—68 R 5 Claims

1. A composition for the grain refinement of aluminium or aluminium alloys consisting essentially of

i. 15 – 85 percent by weight of a material selected from the class consisting of metallic titanium and titanium alloys containing not less than 85 percent titanium,

ii. 2.5 – 70 percent by weight of at least one component selected from the class consisting of sodium borofluoride, potassium borofluoride, sodium titanofluoride, potassium titanofluoride, sodium zirconium fluoride and potassium zirconium fluoride, and

iii. 0 – 46 percent by weight of a metal having a density greater than 4.5 g/cm^3,

the content of said metal not exceeding the content of said component i), the content of component ii) being at least 12 percent of the content of said component i). said component i) having a particle size not greater than 500 microns, and said composition having a density of at least 2.4 g/cm^3.

3,854,936

SMELTING OF NICKEL OXIDE ORES TO PRODUCE FERRONICKEL

Willard L. Hunter; Danton L. Paulson, and William A. Stickney, all of Albany, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sept. 26, 1973, Ser. No. 401,004
Int. Cl. C22b *23/00*
U.S. Cl. 75—82 4 Claims

1. A process for producing ferronickel from nickel oxide ores which comprises:

heating in a furnace a first charge comprising nickel oxide ore with a carbon reductant in an amount sufficient to provide at least 35 percent of the carbon stoichiometrically required to reduce the nickel oxide (NiO) and iron oxide (Fe_2O_3) contained in the ore charge to metal to form a liquid slag depleted in nickel and a liquid ferronickel phase rich in iron;

tapping from the furnace a substantial portion of the nickel-depleted slag;

adding to the furnace, still containing the liquid ferronickel phase, a second charge comprising nickel oxide ore and a carbon reductant in an amount less than 25 percent of the carbon stoichiometrically required to reduce the nickel oxide (NiO) and iron oxide (Fe_2O_3) contained in the second ore charge to metal;

heating the second charge to form a liquid slag rich in nickel and a nickel-rich, ferronickel phase, and

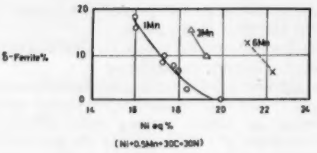
tapping from the furnace a substantial portion of the nickel-rich, ferronickel phase.

3,854,937

PITTING CORROSION RESISTANT AUSTENITE STAINLESS STEEL

Tohru Muta; Hideo Abo, and Sakae Noguchi, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 13, 1971, Ser. No. 207,021
Claims priority, application Japan, Dec. 14, 1970, 45-110594
Int. Cl. C22c *39/30*
U.S. Cl. 75—128 N 1 Claim



1. A pitting corrosion resistant austenite stainless steel consisting essentially of

0.08 percent by weight of carbon,

silicon in an amount not exceeding 4.0 percent by weight,

manganese in an amount not exceeding 5.0 percent by weight,

phosphorus in an amount not exceeding 0.04 percent by weight,

sulfur in an amount not exceeding 0.03 percent by weight,

10 to 18 percent by weight of nickel,

23 to 30 percent by weight of chromium,

0.30 to 0.45 percent by weight of nitrogen, and

0.1 to 4.0 percent by weight of molybdenum,

the balance being iron and unavoidable impurities, said steel satisfying the condition of Ni % + 30 (C % + N %) 20%.

3,854,938

AUSTENITIC STAINLESS STEEL

Howard E. Baybrook, Leechburg, and Joseph A. Chivinsky, Sarver, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 137,957, April 27, 1971, Pat. No. 3,716,691. This application Oct. 16, 1972, Ser. No. 298,055
Int. Cl. C22c *39/20*
U.S. Cl. 75—128 8 Claims

1. An austenitic stainless steel filler metal for use in gas shielded arc welding, consisting essentially of, in weight percent, up to 0.1 percent carbon, 8.5–14.0 percent manganese, up to 0.6 percent silicon, 18.5–23.0 percent chromium, 10.0–16.0 percent nickel, 2.0–3.0 percent molybdenum, 0.2–0.38 percent nitrogen, balance iron and incidental impurities; wherein the ratio of austenitizing elements to ferritizing elements is in excess of 1 in accordance with the following expression:

$$[\%Ni + 30\,(\%C + \%N) + 0.5\,(\%Mn)]/[\%Cr + \%Mo + 1.5\,(\%Si)] > 1$$

wherein said manganese and nitrogen contents are balanced in accordance with the following expression:

$$\%Mn/\%N \quad 42$$

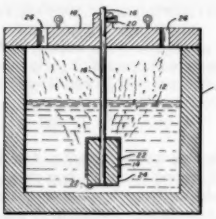
and wherein the sum of said chromium, manganese, nickel and molybdenum contents are in accordance with the following expression:

$$\%Mn + \%Cr + \%Ni + \%Mo \quad 38.$$

3,854,939
METHOD FOR INOCULATING MOLTEN METAL WITH AN INOCULATING MATERIAL

John G. Mezoff, Tulsa, Okla., assignor to American Magnesium Company, Tulsa, Okla.

Filed Apr. 17, 1972, Ser. No. 244,611
Int. Cl. C22c *37/02*
U.S. Cl. 75—130 B 4 Claims



1. The method of inoculating a volume of molten ferrosilicon with magnesium at a controlled rate, comprising the steps of:

coating substantially all of the exterior surface of an ingot of magnesium with a ceramic thermal insulating material except for a small selected uncoated area;

immersing the coated ingot in the said molten ferrosilicon metal.

3,854,940
ELECTROCONDUCTIVE, CORROSION RESISTANT HIGH SILICON ALLOY

Howard H. Hoekje, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 260,790, June 8, 1970, , and a continuation-in-part of Ser. No. 336,288, Feb. 27, 1973, , and a continuation-in-part of Ser. No. 356,972, May 3, 1974, said Ser. No. 336,288, which is a continuation-in-part of Ser. No. 260,790, said Ser. No. 356,972, which is a continuation-in-part of Ser. Nos. 336,288, and Ser. No. 260,790. This application Aug. 27, 1973, Ser. No. 391,118
Int. Cl. B01k *3/06*; C01d *1/08*; C01b *11/25*
U.S. Cl. 75—134 S 16 Claims

1. A silicon base alloy having an electroconductivity greater than 100 (ohm-centimeters)$^{-1}$, consisting essentially of silicon, a dopant, and transition metal present as the silicide thereof, and comprising:

a predominant, discontinuous silicon rich phase;

discrete nodules of a dopant rich phase;

and substantially continuous rivulets of a transition metal silicide rich phase surrounding the silicon rich phase and forming the boundaries thereof.

3,854,941
HIGH TEMPERATURE ALLOY

Hugh Morrow, III, and David L. Sponseller, both of Ann Arbor, Mich., assignors to Americal Metal Climax, Inc., New York, N.Y.

Filed Mar. 15, 1974, Ser. No. 451,439
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 6 Claims

1. A nickel-base superalloy consisting essentially of about 5 to about 7% chromium, about 12 to about 20% molybdenum, about 0.5 to about 1.5% hafnium, about 6.5 to about 7.5% aluminum, about 0.01 to about 0.20% carbon, up to about 15% cobalt and the balance consisting essentially of nickel together with normal residuals and incidental impurities present in conventional amounts.

3,854,942
TRANSPARENCY FOR MULTI-COLOR ELECTROSTATIC COPYING

Alptekin Akman, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

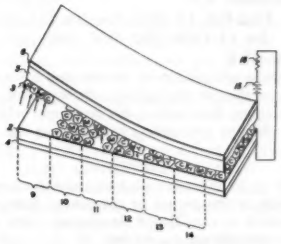
Continuation-in-part of Ser. Nos. 236,585, March 21, 1972, which is a continuation-in-part of Ser. No. 194,547, Nov. 1, 1972. This application Jan. 8, 1973, Ser. No. 321,511
Int. Cl. G03g *13/16*; B44d *1/24*
U.S. Cl. 96—1.2 17 Claims

1. A transparency for the formation of an adherent electrostatic image thereon comprising a thermoplastic film sheet, said sheet having at least one surface coated with a mixture which comprises an acrylic resin, and a vinyl chlorideacetate copolymer resin in a weight ratio of between about 6:4 and 7:3, a wetting agent in an amount of between about 2.5 to 25% by weight of said mixture with an effective amount of a particulate material in said mixture to reduce the static properties of said sheet.

3,854,943
MANIFOLD IMAGING METHOD AND MEMBER EMPLOYING FUNDAMENTAL PARTICLES OF ALPHA METAL-FREE PHTHALOCYANINE

Ray Henry Luebbe, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. Nos. 846,262, July 30, 1969, and Ser. No. 222,619, Feb. 1, 1972, abandoned. This application Feb. 1, 1972, Ser. No. 222,622
Int. Cl. G03g *5/00*, *13/00*, *17/00*
U.S. Cl. 96—1.5 36 Claims



1. A method of imaging comprising providing an imaging layer sandwiched between a donor member and a receiver member, at least one of said members being at least partially transparent to electromagnetic radiation to which said imaging layer is sensitive, said imaging layer comprising electrically photosensitive fundamental particles of alpha metal-free phthalocyanine in the range of from greater than 1 micron to about 25 microns in size and substantially of uniform size; exposing said imaging layer to a pattern of electromagnetic radiation to which said particles are sensitive while applying an electric field across said imaging layer; and during the application of said field separating said receiver member from said donor member whereby exposed particles are removed from said imaging layer in imagewise configuration forming an image conforming to the original on at least one of said members.

3,854,944

PRODUCTION OF A SOUND TRACK WITH ANTI-FOGGANT IN THE REDEVELOPER SOLUTION

Camille Angelina Vandeputte, Mortsel; Roger Joseph Huybrechts, Brussel, both of Belgium; Daniel Jean Gallois, Paris, France, and Roland Gaston Verbrugghe, Mechelen, Belgium, assignors to AGFA-Gevaert, Mortsel, Belgium

Filed Nov. 24, 1972, Ser. No. 309,120

Claims priority, application Great Britain, Nov. 26, 1971, 55093/71

Int. Cl. G03c 4/24, 5/14

U.S. Cl. 96—4 4 Claims

1. In a method for producing a sound track on a photographic silver halide type color material wherein after bleaching the silver contained in the color-developed material, only the sound track area of the material is treated with a redeveloper composition and then the entire material is rinsed and subjected to a fixing treatment to remove the silver compounds remaining after bleaching, the improvement of using a redeveloper composition comprising a developing agent and a fog-inhibiting organic heterocyclic compound having the following structural formula or a tautomeric form thereof:

wherein X is —NH—, —O—, or —S—, and Z represents the atoms necessary to close a 5- or 6-membered ring having only hydrogen, =S, =O, amino and lower alkyl substituents thereon.

3,854,945

SHIFTED INDOPHENOL DYE DEVELOPERS

Walter Monroe Bush, Victor, and Daniel Francis Reardon, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1972, Ser. No. 227,113

Int. Cl. G03c 7/00, 5/54, 1/40, 1/10

U.S. Cl. 96—29 D 39 Claims

1. A photographic element comprising a support and at least one layer thereon containing a photographic silver halide having associated therewith a dye developer which is diffusible in an alkaline processing medium and has the general formula:

D-(SID)

wherein D- is an aromatic nucleus polysubstituted with hydroxy groups, amino groups or alkylamino groups to provide a group which is capable of developing silver halide, and (SID) is an indophenol dye moiety.

3,854,946

PROCESS FOR CHEMICALLY BONDING A DYESTUFF TO A POLYMERIC SUBSTRATE

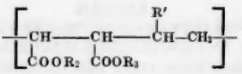
Adnan A. R. Sayigh; Fred A. Stuber, both of North Haven, and Henri Ulrich, North Branford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 93,446, Nov. 27, 1970, Pat. No. 3,784,527, which is a continuation-in-part of Ser. No. 15,852, March 2, 1970, abandoned. This application Sept. 14, 1973, Ser. No. 397,230

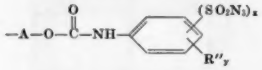
Int. Cl. G03c 1/70, 5/16

U.S. Cl. 96—35.1 12 Claims

1. A process for chemically bonding a basic dye to a substrate containing a plurality of C-H bonds which substrate is not normally receptive to dyestuffs which process comprises: a. applying to the said substrate a radiation sensitive polymer characterized by the recurring unit:



wherein R′ is selected from the class consisting of lower-alkoxy and phenyl and wherein one of R_2 and R_3 represents hydrogen and the other of R_2 and R_3 represents a group having the formula:



wherein A is alkylene having from 2 to 6 carbon atoms separating the valencies and a total carbon atom content of from 2 to 10, R″ is selected from the class consisting of lower-alkyl and halogen, x is an integer from 1 to 2, y is an integer from 0 to 2, provided that $x+y$ is not greater than 3, and the SO_2N_3 group is in any of the positions 3, 4, and 5 in the phenyl nucleus to which it is attached, and at least one of the said positions 3, 4, and 5 is unsubstituted;

b. exposing the treated substrate to appropriate radiation to activate said light and heat-sensitive polymer; and

c. contacting the treated polymer with a basic dye.

3,854,947

PROCESS AND SOLUTION FOR FIXING AN IMAGE ON SILVER HALIDE PRINTS

Edward R. Ritchey, 303 S. 5th St., St. Joseph, Mo. 64501

Filed May 16, 1973, Ser. No. 360,652

Int. Cl. G03c 5/38, 5/26

U.S. Cl. 96—61 R 30 Claims

1. A rapid process for producing a stable visible image in a photographic silver halide emulsion layer containing a latent image,

a. developing said layer in a photographic silver halide developing solution,

b. fixing said silver halide forming the resultant image by immersing said layer in a fixing solution having a major proportion of, (1) a first solution comprising a compound selected from the group consisting of alkali metal thiocyanate, ammonium thiocyanate, alkali metal thiosulfate and ammonium thiosulfate, and, (2) a minor proportion of a second solution including an anionic synthetic detergent having a carbon chain length in the range of about 7 to about 18 carbon atoms per molecule and selected from the group consisting of ammonium lauryl sulfate, sodium lauryl sulfate, potassium lauryl sulfate, alkylated aromatic sulfonic acids, and mixtures thereof, and a water softening agent selected from the group consisting of sodium hexametaphosphate, sodium pyrophosphate, sodium tetraphosphate, and mixtures thereof, wherein said second solution and said first solution are mixed at a ratio of between about 1 ounce to about 20 ounces of said second solution to about 1 gallon of said first solution, and

c. rinsing the resultant image layer in a moving water bath.

18. A fixing solution for fixing a stable visible image on a developed photographic silver halide emulsion layer, comprising: known solution; resultant

a. a major proportion of a first solution including a first compound selected from the group consisting of alkali metal thiocyanate, ammonium thiocyanate, alkali metal thiosulfate and ammonium thiosulfate, and

b. a minor proportion of a second solution including an anionic synthetic detergent having a carbon chain length in the range of between about 7 to about 18 carbon atoms per molecule and selected from the group consisting of ammonium lauryl sulfate, sodium lauryl sulfate, and po-

tassium lauryl sulfate, alkylated aromatic sulfonic acids, and mixtures thereof, and a water softening agent selected from sodium hexametaphosphate, sodium pyrophosphate, sodium tetraphosphate, and mixtures thereof, wherein said second solution and said first solution are mixed at a ratio of between about 1 ounce to about 20 ounces of said second solution to about 1 gallon of said first solution.

3,854,948

NEW DEVELOPMENT COMPOSITION FOR RADIOGRAPHIC FILM

Walfredo Versorese, Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St.Paul, Minn.

Filed May 15, 1972, Ser. No. 253,428

Claims priority, application Italy, May 15, 1971, 50368/71

Int. Cl. G03c *5/30*

U.S. Cl. 96—66 R **10 Claims**

1. A liquid photographic developer having a pH of from about 10 to about 11 and comprising about 10 to about 30 grams per liter of hydroquinone and from about 0.3 to about 0.9 grams per liter of phenidone, said developer further comprising a source of thiosulfate ions in an amount equivalent, in thiosulfate ion, to from about 0.1 to about 1.0 grams per liter of sodium thiosulfate.

3,854,949

SILVER HALIDE PHOTOGRAPHIC COMPOSITIONS AND PROCESSES FOR OBTAINING POSITIVE IMAGES

Paul Brewster Gilman, Jr., Rochester; Ronald George Raleigh, Brockport, and Joseph Andrew Merrigan, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 123,007, March 10, 1971, Pat. No. 3,761,267. This application Jan. 18, 1973, Ser. No. 324,609

Int. Cl. G03c *1/48*

U.S. Cl. 96—76 R **10 Claims**

1. In an image transfer film unit which comprises an image-receiving layer, at least one layer of a photosensitive composition and a processing composition which can be discharged to facilitate development of a photosensitive composition by passing said unit between a pair of juxtaposed pressure-applying members, the improvement comprising 1) at least one layer of a photosensitive composition of said film unit comprising

(a) silver halide grains having polyvalent metal ions occluded therein, said grains containing only minimal developable surface latent images wherein processing for 5 minutes at 27°C in Kodak Developer DK-50 will provide a density of less than 0.25 when coated at a coverage of between about 300 to 400 mg. of silver per square foot and (b) at least one sensitizing dye used at a concentration which would lower the blue-speed sensitivity of an undoped, control sulfur and gold surface-sensitized silver bromoiodide emulsion, containing 6 mole percent iodide, of similar grain size and distribution at least 0.3 log E when developed at 25°C in a surface developer and 2) a fogging agent located in said film unit whereby it will contact said photosensitive composition upon discharge of the processing composition.

3,854,950

HALATION PROTECTION FOR MULTILAYER IMAGING OF PHOTOPOLYMERS

Robert Paul Held, Englishtown, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 9, 1972, Ser. No. 261,204

Int. Cl. G03c *1/92, 7/16, 5/24, 1/84, 1/68*

U.S. Cl. 96—82 **19 Claims**

1. A substantially clear and colorless photosensitive composition comprising (a) a photohardenable material having ethylenically unsaturated or benzophenone type groups, (b) a photoinitiator activatable by actinic radiation in the rear ultraviolet wavelength spectral region, and (c) a sufficient amount of an ultraviolet radiation absorbing material, which absorbs the radiation, to reduce ultraviolet actinic radiation transmitted by a layer no more than 0.001 inch thick of the photohardenable composition by more than about 50 percent, the photohardenable layer visually transmitting or reflecting virtually white light.

3,854,951

METHOD FOR MAKING A RADIATION SENSITIVE RECORDING MATERIAL CONTAINING A SPIROPYRAN COMPOUND, AN HX-DONOR A BINDER, AND ETHYL ACETATE AS SOLVENT

Gunther Arnold, and Hans-Peter Vollmer, both of Ulm/Donau, Germany, assignors to Lincentia Patent-Verwaltungs G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 17, 1972, Ser. No. 235,792

Claims priority, application Germany, Mar. 17, 1971, 2112836

Int. Cl. G03c *1/52*

U.S. Cl. 96—90 PC **4 Claims**

1. In a method for making a radiation-sensitive recording material from a spiropyran compound, an HX-donor for giving off HX when irradiated by light of predetermined energy, X indicating a halogen atom, and a binder therefor, wherein the spiropyran compound and the HX-donor are distributed through said binder in a solvent, the improvement wherein the spirain fraction of the spiropyran compound is reduced by having an ester means in said solvent in the proportion of at least 10 mols of said ester means to each mol of said HX-donor, the ester means being ethyl acetate.

3,854,952

PHOTOSENSITIVE SILVER HALIDE COMPOSITION

John Thomas Kenney, Trenton, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Sept. 19, 1973, Ser. No. 398,719

Int. Cl. G03c *1/02*

U.S. Cl. 96—94 BF **11 Claims**

1. A photosensitive silver halide composition comprising a silver halide deposited on colloidal particles of a hydrous oxide of an element selected from the group consisting of Be, Mg, Ti, Zr, V, Cr, Mo, W, Mn, Fe, Co, Ni, Cu, Zn, Cd, Hg, Al, In, Tl, Si, Ge, Sn, Bi, Th, and mixtures thereof.

3,854,953

DIRECT POSITIVE-TYPE MULTI-LAYER LIGHT-SENSITIVE MATERIAL

Keisuke Shiba; Hiroyuki Amano; Hirozo Ueda, and Akira Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Company, Ltd., Kanagawa, Japan

Filed Apr. 20, 1972, Ser. No. 246,074

Claims priority, application Japan, Apr. 20, 1971, 46-24967

Int. Cl. G03c *1/36*

U.S. Cl. 96—101 **32 Claims**

1. A direct positive-type multi-layer light-sensitive silver halide material having high information packing capacity comprising a support having thereon at least two emulsion layers selected from the group consisting of (A) a chemically fogged direct positive-type light-sensitive silver halide emulsion in which at least one of a halogen acceptor and an electron acceptor is adsorbed on the silver halide grains, and grains having free electron trapping nuclei therein, (B) a chemically fogged direct positive-type light-sensitive halide emulsion in which at least an electron acceptor is adsorbed on the silver halide grains, said grains being substantially free from positive hole trapping nuclei therein and (C) a chemically fogged direct positive-type light-sensitive silver halide emulsion in which at least a halogen acceptor is adsorbed on the silver halide grains, said grains having free electron trapping nuclei therein but being substantially free from positive hole trapping nuclei therein, said emulsions each having a

different sensitized wavelength region, said emulsion layers being the same type emulsion layers or different type emulsion layers having therebetween an intermediate layer preventing diffusion or interaction of said electron acceptor or halogen acceptor between said emulsion layers, the halogen acceptor or electron acceptor in an emulsion layer differing from the halogen acceptor or electron acceptor in an emulsion layer sensitized to a different wavelength region, said intermediate layer illustrating substantially no desensitizing effect on said emulsion layers.

3,854,954

SILVER HALIDE EMULSION CONTAINING A STABILIZING COMBINATION OF AN AZAIDENE AND A N,N-DIALKYL-DITHIOCARBAMIC ACID ESTER

Wolfgang Himmelmann, Opladen; Anita Von Konig; Franz Moll, both of Leverkusen, and Wilhelm Saleck, Schildgen, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 176,326, Aug. 30, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 392,024

Claims priority, application Germany, Sept. 1, 1970, 2043205

Int. Cl. G03c *1/34*

U.S. Cl. 96—109 **3 Claims**

1. A photographic element having at least one light-sensitive silver halide emulsion layer which a stabilizing amount of an azaindene selected from the group consisting of tetra or penta azaindene substituted with hydroxyl or amino groups and a N,N-dialkylthiocarbamic acid ester of the following formula:

$$R_1 - S - CS - N(R_2)_2$$

wherein

R_1 represents (1) a phenyl ring, which may be substituted with an alkyl, alkoxy, alkylthio, nitro, halogen or cyano group; or (2) a s-triazine ring, which may be substituted with a halogen, aryl, alkylamino, arylamino, alkoxy, aroxy and the dialkylaminodithiocarbamic acid group;

R_2 represents a straight chained or branched alkyl wherein the light-sensitive silver halide emulsion layer contains the dialkylthiocarbamic acid ester in quantities of 5 to 10 milligrams per kilogram of emulsion.

3,854,955

SUPERSENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Keisuke Shiba; Masanao Hinata; Akira Sato; Akira Ogawa, and Tadashi Ikeda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

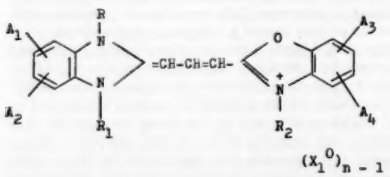
Filed Jan. 5, 1973, Ser. No. 321,423

Claims priority, application Japan, Jan. 14, 1972, 47-6315

Int. Cl. G03c *1/14*

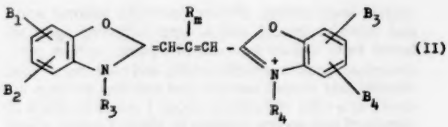
U.S. Cl. 96—124 **17 Claims**

1. A silver halide photographic emulsion comprising a supersensitizing amount of at least one benzimidazolo.oxacarbocyanine dye represented by general formula (I)



(I)

and at least one oxacarbocyanine dye represented by general formula (II)



(II)

wherein A_1 and A_2 each represents a hydrogen atom, a halogen atom, a hydroxyl group, an alkoxyl group, an amino group, an acylamido group, an acyloxyl group, an alkoxycarbonylamino group, a cyano group, a trifluoromethyl group, an alkoxycarbonyl group, an alkylsulfonyl group, a sulfamyl group, an alkylaminosulfonyl group, a morpholinosulfonyl group, a morpholinocarbonyl group, a piperidinosulfonyl group, a carbamoyl group, or an alkylcarbamoyl group;

A_3 and A_4 represent the atomic groups necessary to form a benzene ring together; B_1, B_2, B_3, and B_4 are selected from the group consisting of a hydrogen atom, a lower alkyl group, a halogen atom, an alkoxyl group, a hydroxyl group, a phenyl group, a carboxyl group, an alkoxycarbonyl group, a cyano group, a trifluoromethyl group, an amino group, an acyl group, an acyloxyl group, an alkoxycarbonylamino group or a carbalkoxy group; R, R_1, and R_3 each represents an alkyl group; at least one of R_1 and R_2 being a sulfoalkyl group or a carboxyalkyl group; R_m represents a hydrogen atom, an alkyl group or an aryl group; R_3 and R_4 have the same meaning as R_1 and R_2; X_1 represents an anion; *m* and *n* each represents 1 or 2; said dyes forming an intramolecular salt when *m* and *n* are 1; and X_2 represents an anion.

3,854,956

DYESTUFFS AND SPECTRAL SENSITIZERS FOR SILVER HALIDE

Lewis L. Lincoln, and Donald W. Heseltine, both of, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 30, 1970, Ser. No. 85,707

Int. Cl. G03c *1/16*, *1/18*, *1/20*

U.S. Cl. 96—131 **17 Claims**

1. A light-sensitive photographic silver halide emulsion comprising a hydrophilic colloid, silver halide grains and a sensitizing amount of a polymethine dye comprising two terminal nuclei including at least one heterocyclic nucleus having in said nucleus at least one nitrogen atom and optionally containing another atom selected from the group consisting of oxygen, sulfur and selenium, and having the nitrogen atom joined to a polymethine chain intervening said terminal nuclei and including at least one nuclear carbon of said heterocyclic nucleus, said nitrogen atom having substituted thereon a number selected from the group consisting of (A) a member having the formula $-(CH_2)_n-R$ wherein:

1. *n* represents a positive integer of from 2 to 6 and
2. R represents a member selected from the group consisting of:
   a. an acyl radical,
   b. a radical having the formula

wherein T^1 and T^2, when taken alone, each represents a member selected from the group consisting of an alkoxy radical and an alkylthio radical, and T^1 and T^2, when taken together, represent the atoms necessary to complete a cyclic acetal selected from the group consisting of cyclic oxyacetals and cyclic thioacetals containing from 5 to 6 atoms in the heterocyclic acetal ring,

   c. a 1-hydroxy-1-sulfoalkyl radical, and
   d. a 1-hydrazonalkyl radical, and

(B) in dyes having an α-methine carbon atom, a member having the formula $—CH_2—CH=CH=$, linking said nitrogen atom to α-methine carbon atom.

3,854,957

METALLIZATIONS COMPRISING NICKEL OXIDE

John Robert Larry, Youngstown, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 28, 1973, Ser. No. 392,240
Int. Cl. C23c 3/04
U.S. Cl. 106—1 16 Claims

1. In finely divided powders comprising noble metals useful in forming conductor patterns on dielectric substrates, the improvement of adding to such powders finely divided nickel oxide, in an amount effective to increase the adhesion of the resultant noble metal conductor pattern to the substrate.

3,854,958

STABILIZATION OF ETHYL CELLULOSE WITH SODIUM OMICRON AND RHO NITROBENZOATES

Philip M. Sarnacke, and Wesley L. Archer, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 289,005, Sept. 14, 1972, abandoned. This application July 23, 1973, Ser. No. 381,943
Int. Cl. C09d 5/08; C08b 27/48, 27/36
U.S. Cl. 106—14 6 Claims

1. An ethyl cellulose composition stabilizer against corrosive discoloration in the presence of iron and moisture consisting essentially of:

A. An ethyl cellulose having an apparent pH greater than about 5.7 measured as a 5 weight percent solution in 80:20 toluene:2B ethanol, and

B. A small but sufficient amount of sodium o-nitrobenzoate or sodium p-nitrobenzoate or a mixture thereof to inhibit the discoloration of said ethyl cellulose in contact with iron and moisture.

3,854,959

INHIBITION OF CORROSION

Winston Costain, and Bernard William Hugh Terry, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 6, 1973, Ser. No. 338,526
Claims priority, application Great Britain, Mar. 8, 1972, 010724/72
Int. Cl. C09d 5/08
U.S. Cl. 106—14 3 Claims

1. A method of inhibiting the corrosion of steel by acidic compounds which comprises adding to the acidic compound a corrosion inhibiting amount of a mixture of a nitrile and an oxime in which the nitrile group or oxime group, or both, form part of a conjugated unsaturated system, or a mixture of a compound selected from said nitriles and oximes with at least one compound selected from aliphatic and aromatic aldehydes and ketones and organic amines.

3,854,960

ANTI-FOULING PAINTS

Hans Plum, Heessen; Friedrich Runggas, Dortmund; Manfred Von Haaren, Unna-Afferde, and Horst Krase, Kamen, all of Germany, assignors to Schering AG, Berlin & Bergkamen, Germany

Filed Aug. 13, 1973, Ser. No. 387,589
Claims priority, application Germany, Aug. 17, 1972, 2240487
Int. Cl. C09d 5/16
U.S. Cl. 106—15 AF 4 Claims

1. In an anti-fouling paint comprising tributyl tin oxide as the anti-fouling agent present in a paint vehicle, the improvement wherein said tributyl tin oxide is present in combination with from about 5 to about 50 percent, by weight of said tributyl tin oxide, of at least one member selected from the group consisting of colloidal silicic acid prepared by the flame hydrolysis of silicon tetrachloride and montmorillonite modified with a quaternary amine salt.

3,854,961

PREPARATION OF HIGH TEMPERATURE SHELL MOLDS

John Robert Flasch, Adrian, Mich., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 102,907, Dec. 30, 1970,. This application Apr. 9, 1973, Ser. No. 349,148
Int. Cl. B28b 7/34
U.S. Cl. 106—38.3 9 Claims

1. In a method for preparing shell molds for precision casting which comprises precoating an expendable pattern with a slurry containing a refractory material, a zirconium compound and an organic solvent, stuccoing the coated pattern, contacting the coated pattern with a gelling agent selected from the class consisting of ammonia and amines having up to 10 carbon atoms and thereafter applying a backup coat comprising a refractory material, an acid hydrolyzed orthosilicate binder and an organic solvent to said precoat, the improvement which comprises contacing said gelled precoat with an organic solvent having a boiling point below about 250°C. and containing sufficient acid to provide a hydrogen ion concentration of from 0.001 mole to 0.1 mole per liter of solvent, said solvent is selected from the class consisting of aliphatic and aromatic hydrocarbons, chlorinated hydrocarbons, alcohols, ketones, esters, ethers, glycols and glycol ethers.

3,854,962

POLYHYDROXY FILLERS FOR PATTERN MATERIALS

Fred B. Speyer, Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 250,492, May 5, 1972, abandoned. This application May 17, 1973, Ser. No. 361,247
Int. Cl. C08h 9/00; B28b 7/34
U.S. Cl. 106—38.7 7 Claims

1. In a pattern composition for producing investment casting molds, said pattern composition evidencing good oxidation resistance, being devoid of noxious fumes on melting, having quick setting properties, having low ductility, and having low shrinkage properties, said pattern consisting essentially of a natural wax, a synthetic wax, or a mixture thereof in an amount of at least 40 percent by weight, a fatty acid containing from 12 to 22 carbon atoms per molecule in an amount of 1 to 25 percent by weight and a filler; the improvement comprising, as said filler, a polyhydric alcohol having a melting point above the melting point of said wax in an amount of from 5 to 50 percent by weight.

3,854,963

AGCL-NUCLEATED GLASS-CERAMIC ARTICLES

Hermann L. Rittler, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 11, 1973, Ser. No. 359,431
Int. Cl. C03c 3/22
U.S. Cl. 106—39.6 5 Claims

1. A glass-ceramic article essentially free from alkali metal oxides and the alkaline earth metal oxides MgO, CaO, and SrO which exhibits a coefficient of thermal expansion over the range 25°–900 C. of between about 0–25 × 10^{-7}/°C. and a dense white opacity in cross sections thinner than ⅛ inch, said dense opacity resulting from a crystal content greater than 75% by weight wherein said crystal content consists essentially of crystals having diameters not exceeding about 1 900°and being selected primarily from the group consisting of zinc petalite solid solution and beta-quartz solid solution, the composition of said article being substantially the same throughout and consisting essentially, by weight on the oxide basis, of

about 10–20% ZnO, 10–20% Al_2O_3, 50–75% SiO_2, and at least 0.1% by weight of AgCl effective to nucleate said crystals.

3,854,964
LEAD SILICATE HIGH VOLTAGE VACUUM TUBE GLASS ENVELOPE

George L. Thomas, Chesterland, and Leonard M. Reitz, South Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 234,349, March 13, 1972, abandoned. This application Sept. 24, 1973, Ser. No. 399,942

Int. Cl. C03c *3/10, 3/24, 3/30*

U.S. Cl. 106—53 **4 Claims**

1. In a high voltage vacuum tube having a glass envelope, the improvement in which said glass envelope is a glass which is highly absorbent to X-radiation in the wavelength range from 0.3 – 0.7 A consisting of, by weight: 30–40% SiO_2, 3–7% K_2O, 0–2% Na_2O, 0–3% Al_2O_3, 35–50% PbO, 0–15% BaO, 0–15% Sb_2O_3, and 0–15% CdO wherein the aggregate total of BaO + Sb_2O_3 + CdO is greater than 10% and the aggregate total of PbO + BaO + Sb_2O_3 + CdO is greater than 55%, said glass having an average coefficient of thermal expansion over the range 0° to 300°C from 85 to 93 × 10^{-7} cm/cm/°C and a working range greater than 240°C.

3,854,965
METHOD OF MANUFACTURE OF ALUMINA SUBSTRATE WITH IMPROVED SMOOTHNESS AND ELECTRICAL PROPERTIES

Koichi Niwa; Yoshiharu Anzai, both of Tokyo; Kaoru Hashimoto, Kawasaki, and Hiromi Yokoyama, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 22, 1973, Ser. No. 334,615

Claims priority, application Japan, Mar. 3, 1972, 47-22112

Int. Cl. C04b *35/10*

U.S. Cl. 106—62 **7 Claims**

1. A method of manufacture of an alumina substrate with improved surface smoothness and electrical properties, comprising the steps of

making a mixture powder containing magnesium oxide of 0.1 to 0.4 wt %, chromium oxide of 0.001 to 0.05 wt % and a remainder of alumina powder;

producing a slip from the mixture powder;

forming a green sheet by casting the slip; and

firing the green sheet at a temperature in the range of 1550 to 1670°C.

3,854,966
CASTABLE REFRACTORIES FOR THE USE OF AN IMPELLER TO STIR MOLTEN PIG IRON TO WHICH AN ALKALINE ADDITIVE IS ADDED

Kenjiro Kanbara; Satoshi Nagai, and Hiroki Yanagi, all of Hyogo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 26, 1972, Ser. No. 318,676

Claims priority, application Japan, Dec. 29, 1971, 47-2839

Int. Cl. C04b *35/02*

U.S. Cl. 106—64 **4 Claims**

1. Castable refractories for use as an impeller to stir molten pig iron to which an alkaline additive is added consisting essentially of chamotte and aluminous cement, said chamotte being obtained by burning fire clay consisting essentially of kaolinite, the amount of said aluminous cement being 12–25% by weight per total amount of the refractories, in which said castable refractories contain 5–25% by weight of chamotte having a particle size of 0.8 – 5.0 cm^3 in volume.

3,854,967
HIGH TEMPERATURE- AND CORROSION-RESISTANT MATERIAL

Klaus Reinmuth, Durath, Germany, assignor to Elektroschmelzwerk Kempten GmbH, Munchen, Germany

Filed June 27, 1973, Ser. No. 374,012

Claims priority, application Germany, July 7, 1972, 2236437

Int. Cl. C04b *35/58*

U.S. Cl. 106—65 **2 Claims**

1. Process for the production of refractory, corrosion-resistant articles which comprises compressing at temperatures of the order of 1,500°–2,200°C and pressures of the order of 30–200 kg/cm^2 a mixture of 10–60 percent, by weight, of aluminum nitride and 90–40 percent, by weight of boron nitride containing 5–25 percent, by weight, of boron oxide.

3,854,968
LIME-FLY ASH CEMENTITIOUS MIXTURE WITH IMPROVED HARDENING AND EXPANSION CHARACTERISTICS

Leonard John Minnick, Cheltenham; William C. Webster, Warminster, and Charles L. Smith, Conshohocken, all of Pa., assignors to I U Conversion Systems, Inc., Philadelphia, Pa.

Division of Ser. No. 42,024, June 1, 1970, abandoned. This application Feb. 15, 1972, Ser. No. 226,506

Int. Cl. C04b *11/00, 7/12*

U.S. Cl. 106—109 **4 Claims**

1. A method of producing a highly reactive sulfated lime product comprising

I. contacting quicklime with

a. sulfuric acid, the quantity of said sulfuric acid being limited so that the mole ratio of sulfuric acid to quicklime does not exceed 3.3 : 4.3, and

b. water in an amount sufficient to hydrate that portion of the quicklime not converted to sulfate compounds by reaction with the sulfuric acid,

II. and permitting said materials to remain in contact until reaction therebetween is substantially complete and any excess water is substantially removed by volatilization.

3,854,969
DYESTUFF PREPARATIONS AND PRINTING INKS

Guenther Zwahlen, Dornach, Switzerland, assignor to Ciba-Geigy, Basel, Switzerland

Continuation of Ser. No. 99,678, Dec. 18, 1970, abandoned, which is a continuation-in-part of Ser. No. 743,287, July 9, 1968, abandoned. This application Apr. 27, 1973, Ser. No. 354,978

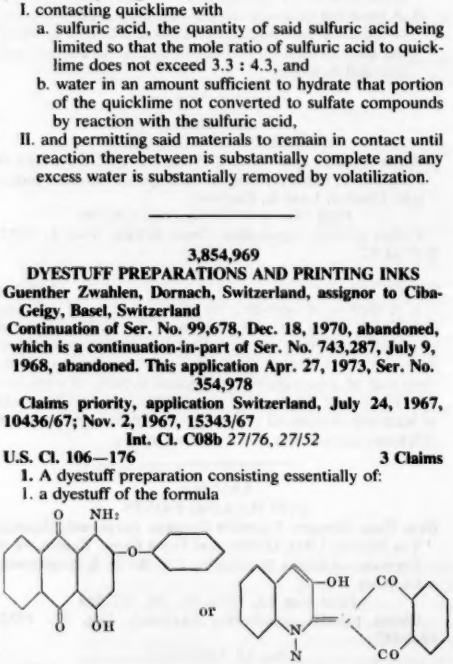
Claims priority, application Switzerland, July 24, 1967, 10436/67; Nov. 2, 1967, 15343/67

Int. Cl. C08b *27/76, 27/52*

U.S. Cl. 106—176 **3 Claims**

1. A dyestuff preparation consisting essentially of:

1. a dyestuff of the formula



and

2. ethyl cellulose,

the ratio of the dyestuff to ethyl cellulose being between 9:1 and 1:4.

3,854,970
CATIONIC STARCH AND CONDENSATES FOR MAKING THE SAME

Thomas Aitken, Chicago, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

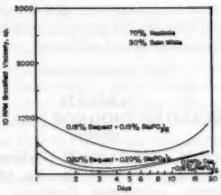
Filed Aug. 13, 1973, Ser. No. 387,828
Int. Cl. C08b 25/02
U.S. Cl. 106—210 8 Claims

1. A method of making a cationic starch suitable for wet-end papermaking which comprises producing gelatinous starch from granular starch, treating said starch with alkaline agent, and adding to said starch 1–7% of a condensate of generally equimolar quantities of epichlorohydrin and dimethylamine wherein the percentage of said condensate is calculated from granular starch.

3,854,971
SATIN WHITE-CLAY COMPOSITIONS AND METHODS OF MANUFACTURE

Robert F. Conley, Elizabeth, N.J.; Billy Reid Catherwood, Macon, Ga., and Mary Kate Lloyd, Elizabeth, N.J., assignors to Georgia Kaolin Company, Elizabeth, N.J.

Filed Apr. 17, 1968, Ser. No. 721,955
Int. Cl. C08b 27/02
U.S. Cl. 106—214 9 Claims



1. The method of producing an improved dry particulate coating pigment containing satin white and kaolin which after drying may subsequently be made up into aqueous coating compositions the steps of:

a. forming a satin white composition in aqueous suspension;

b. adding a kaolinite to said aqueous suspension of satin white in sufficient amount to retain the effectiveness of satin white as a paper coating pigment on rewetting after

c. removing water from the aqueous suspension to form a free flowing powder.

3,854,972
LIGHT-WEIGHT AGGREGATES

Miroslav Kratochvil, Bondi Junction, New South Wales, Australia

Filed May 7, 1973, Ser. No. 358,042
Int. Cl. C09c 1/00
U.S. Cl. 106—288 B 11 Claims

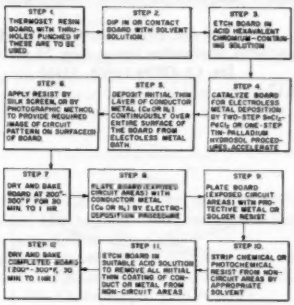
1. In a process for treating a coarse grained mud or soil having a relatively large quantity of material with a grain size larger than the order of 5 to 7 microns and containing organic or mineral detritus or waste that is gasifiable during firing of the dry crushed mud or soil in a kiln at a firing temperature sufficient to sinter the mud or soil and to cause gasification of said organic or mineral detritus or waste with bloating of the mud or soil to produce voids therein to form a light weight aggregate, the improvement comprising:

forming voids within said mud or soil prior to or during said firing which voids are in addition to voids formed through gasification of said organic or mineral detritus or waste, whereby said coarse grained mud or soil is made usable in the formation of a light weight aggregate.

3,854,973
METHOD OF MAKING ADDITIVE PRINTED CIRCUIT BOARDS

Mark Mersereau, Cheshire; Harold L. Rhodenizer, Bethlehem; John J. Grunwald, New Haven, and William P. Innes, Cheshire, all of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

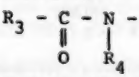
Division of Ser. No. 5,561, Jan. 26, 1970, Pat. No. 3,698,940, which is a continuation-in-part of Ser. No. 834,982, June 20, 1969, abandoned. This application Aug. 16, 1972, Ser. No. 280,956
Int. Cl. C23c 3/00
U.S. Cl. 117—47 A 1 Claim


STEP 1.
THERMOSET RESIN BOARD, WITH THRU-HOLES PUNCHED IF THESE ARE TO BE USED
STEP 2.
DIP IN OR CONTACT BOARD WITH SOLVENT SOLUTION.
STEP 3.
ETCH BOARD IN ACID HEXAVALENT CHROMIUM-CONTAINING SOLUTION
STEP 4.
CATALYZE BOARD FOR ELECTROLESS METAL DEPOSITION BY TWO-STEP $SnCl_2$-$PdCl_2$ OR ONE-STEP TIN-PALLADIUM HYDROSOL PROCEDURES, ACCELERATE
STEP 5.
DEPOSIT INITIAL THIN LAYER OF CONDUCTOR METAL (Cu OR Ni_2) CONTINUOUSLY OVER ENTIRE SURFACE OF THE BOARD FROM ELECTOLESS METAL BATH.
STEP 6.
APPLY RESIST BY SILK SCREEN, OR BY PHOTOGRAPHIC METHOD, TO PROVIDE REQUIRED IMAGE OF CIRCUIT PATTERN ON SURFACE(S) OF BOARD.
STEP 7
DRY AND BAKE BOARD AT 200°-300°F FOR 30 MIN. TO 1 HR.
STEP 8
PLATE BOARD (EXPOSED CIRCUIT AREAS) WITH CONDUCTOR METAL (Cu OR Ni_2) BY ELECTRO-DEPOSITION PROCESS.
STEP 9
PLATE BOARD (EXPOSED CIRCUIT AREAS) WITH PROTECTIVE METAL OR SOLDER RESIST
STEP 10
STRIP CHEMICAL OR PHOTOCHEMICAL RESIST FROM NON-CIRCUIT AREAS BY APPROPRIATE SOLVENT
STEP 11
ETCH BOARD IN SUITABLE ACID SOLUTION TO REMOVE ALL INITIAL THIN COATING OF CONDUCTOR METAL FROM NON-CIRCUIT AREAS.
STEP 12
DRY AND BAKE COMPLETED BOARD (200°–300°F, 30 MIN. TO 1 HR.)

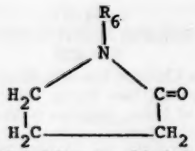
1. An article of manufacture comprising a substrate member activated for direct plating with metal by immersion in an electroless metal plating bath to provide an adherent metal deposit thereon, wherein said substrate member is composed of a molded polymerized thermoset resin, said member being prepared by:

a. contacting the surface of the substrate member with a dipolar aprotic organic liquid solvent of the group consisting of Compositions I, II and III, wherein Compositions I are those having the formula:

wherein R_1 is selected from the group consisting of hydrogen and alkyl of from 1 to 5 inclusive carbon atoms, and R_2 is alkyl of from 1 to 5 inclusive carbon atoms; Compositions II are those having the formula:



wherein R_3 is selected from the group consisting of hydrogen and alkyl of from 1 to 3 inclusive carbon atoms, R_4 is selected from the group consisting of hydrogen and alkyl of from 1 to 5 inclusive carbon atoms, and R_5 is selected from the group consisting of hydrogen and alkyl of from 1 to 5 inclusive carbon atoms; and Compositions III are those having the formula:



wherein R_6 is alkyl of from 1 to 5 inclusive carbon atom;

b. contacting the solvent-treated surface of the substrate member with an aqueous hexavalent chromic acid solution;

c. contacting the surface of the member with an aqueous solution of a precious metal to catalyze said surface; and

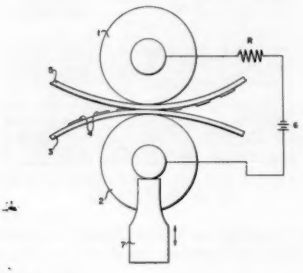
d. heating the catalyzed substrate member at a temperature above ambient but substantially below that at which charring of the resin occurs.

3,854,974

METHOD FOR TRANSFERRING A TONER IMAGE

Masamichi Sato, Tucson, Ariz., and Osamu Fukushima, Tokyo, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 20, 1973, Ser. No. 333,825
Claims priority, application Japan, Aug. 28, 1970, 45-75321
Int. Cl. G03g *13/16, 15/16*
U.S. Cl. 117—17 **9 Claims**



1. A method of transferring a toner image from a toner substrate to a transfer sheet which comprises bringing the toner substrate bearing the toner image and the transfer sheet together into face to face contact, vibrating said substrate and said sheet while they are in contact with each other and simultaneously applying a transfer means to effect the transfer of said toner image to said transfer sheet.

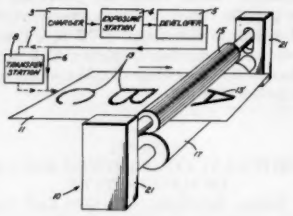
3,854,975

PRESSURE FIXING OF TONERS

Richard S. Brenneman, Natick; David W. Lovering, Needham, both of Mass., and Frederick E. Barr, Vermillion, Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 51,089, June 30, 1971, abandoned, which is a continuation of Ser. No. 694,515, Dec. 29, 1967, abandoned. This application Mar. 12, 1973, Ser. No. 340,600
Int. Cl. G03g *13/20, 15/20*
U.S. Cl. 117—21 **21 Claims**

1. The method of providing a permanent image on a substrate of substantial width, wherein the image is a fixed powder image of electroscopic toner powder having a predetermined threshold pressure, comprising the steps of creating an electrostatic charge pattern in image configuration: depositing electroscopic toner powder upon said substrate to form an image pattern configuration under the electrical control of said charge pattern to create a workpiece having thickness variations; and fixing the toner powder image to said substrate, wherein the last mentioned step includes providing two unheated elastic pressure members which progressively contact each other along a narrow band defining a nip, said members possessing moduli of elasticity compression permitting, when said members are loaded sufficiently to provide a calculated peak nip pressure in excess of the threshold pressure for the toner, deformation at said nip in an amount corresponding to a substantial multiple of the thickness variation of said workpiece; and loading said pressure members to an extent providing a calculated peak nip pressure in excess of said threshold pressure for the toner when said workpiece is disposed between said members, and passing said workpiece through said nip between the pressure members to pressure fix said powder image upon said substrate.

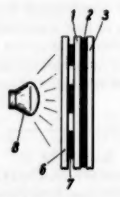


3,854,976

APPLICATOR AND METHOD FOR MAKING A PRINTING FORM

Gerhard Ritzerfeld, 1000 Berlin 33 (Dahlem), Germany

Filed Sept. 23, 1971, Ser. No. 182,983
Claims priority, application Germany, Sept. 25, 1970, 2049019
Int. Cl. B41m *5/10;* **C04b** *35/00*
U.S. Cl. 117—36.1 **10 Claims**

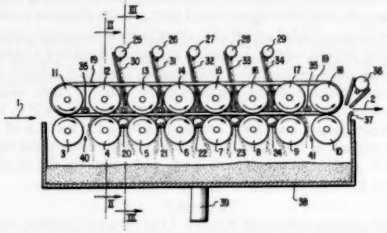


1. A method of making a printing form, comprising the steps of providing a printing sheet having a face on which a printable outline of an image is to be formed; providing a carrier sheet having a surface provided with a layer, said layer including microcapsules containing a fast drying oleophilic lacquer comprising a mixture of at least one resin and at least one liquid solvent which is to be transferred at least in part to said face to form said outline, said lacquer including a mixture of at least one thermoplastic resin and at least one liquid solvent; contacting said layer with said face; releasing said lacquer from at least some of said microcapsules by transmitting energy to regions of said layer corresponding to said outline so that the released lacquer contacts said face along said outline thereby enabling an adherent coating to be formed on said face along said outline; and separating said sheets; whereby a printing form having said outline is obtained.

3,854,977
ELECTROPHOTOGRAPHIC DEVELOPING METHOD AND APPARATUS

Osamu Fukushima, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 30, 1971, Ser. No. 214,247
Claims priority, application Japan, Dec. 30, 1970, 45-122800
Int. Cl. G03g *13/10, 15/10*
U.S. Cl. 117—37 LE **5 Claims**

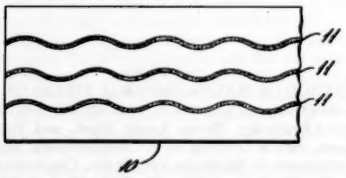


1. A method for developing an electrostatic latent image characterized by passing an electrostatic latent image bearing sheet between a plurality of electroconductive rollers provided between a pair of side plates and a plurality of spaced driving rollers disposed in contact with and beneath said electroconductive rollers, the approximate ends of said electroconductive rollers and said driving rollers extending between said side plates, said driving rollers carrying said latent image bearing sheet by frictionally holding it between the driving rollers and said electroconductive rollers, applying liquid developer to said electrostatic latent image from above the electroconductive rollers, and providing in the spaces between said driving rollers other rollers which are disposed between both side plates so that the developer applied from overhead is prevented from freely falling down but is temporarily restrained in a liquid reservoir formed by said driving rollers and said other rollers, said liquid reservoir being formed over the length of the passage of said latent image bearing sheet, so as to effect development of the latent image when the sheet is passed through said reservoir of developer.

3,854,978
METHOD FOR MANUFACTURING A NON-SLIP WAISTBAND PRODUCT

Roger G. Campbell, Sr.; Richard E. Goff, Jr., both of Barrington, and Thomas L. Staffier, Pawtucket, all of R.I., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 24, 1972, Ser. No. 309,382
Int. Cl. B05c *3/20*
U.S. Cl. 117—44 **2 Claims**



1. A method for producing a product suitable for use in the manufacture of non-slip waistbands comprising; applying to one surface of a permeable base fabric in a pattern an elastomeric silicone compound, said silicone compound having a viscosity of between 12,000 and 25,000 centipoises, and a tack-free time of less than 40 minutes, gelling said compound to allow it to seep in and adhere to the permeable portions of said fabric, curing said compound at a temperature of from 90°F. to 185°F. in an atmosphere containing at least 7 grains of water per cubic foot for a period of time of from 5 to 30 minutes and aging said cured compound and fabric for a period of at least 1 hour to remove volatile toxic material from the compound and fabric whereby a dry cleanable, washable, color fast product is produced.

3,854,979
PROCESS FOR APPLYING GLASSY CARBON COATINGS

Ronald C. Rossi, Torrance, Calif., assignor to The Aerospace Corporation, El Segundo, Calif.

Filed June 29, 1972, Ser. No. 267,436
Int. Cl. B44d *1/20*
U.S. Cl. 117—46 CC **9 Claims**

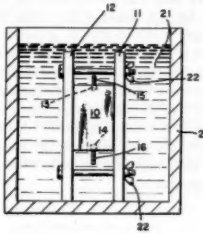
1. The process of glazing an article formed from carbon or ceramic material said process comprising:

a. first heating a mass of an organic glassy-carbon precursor material selected from the group comprising halogenated linear polymers and natural organic polymers in an inert atmosphere until decomposition to a pitch-like compound having the approximate empirical formula C_nH_n, where n is a whole number,
b. blending the resultant compound with an aromatic solvent to form a slurry,
c. coating the article with the slurry, and,
d. baking the article at an elevated temperature in an inert atmosphere until the coating is transformed to glassy carbon.

3,854,980
SOLID DIELECTRIC CAPACITORS AND METHOD

John Burnham, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 252,121, May 10, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,393
Int. Cl. B44d *1/36;* **B32b** *27/38*
U.S. Cl. 117—61 **4 Claims**



1. A method of producing an improved dielectric high voltage capacitor comprising the steps of:

a. mounting a prefabricated hot-dry capacitor section between a pair of adjustable pressure plates in a container;
b. evacuating said container to remove substantially all of the entrapped air;
c. submerging said capacitor section in a liquid composition of a polymerizable resin having a shrinkage factor of less than 2 percent and a curing agent while under vacuum whereby said section is impregnated with said liquid composition;
d. returning said container to atmospheric pressure and applying an inert gas pressure of the order of 90 to 1,000 psig until resin is completely driven into the section;
e. returning the container to atmospheric pressure and pressing the section while still submerged in the resin to an appropriate capacitance;
f. reapplying an inert gas pressure of from 90 to 1,000 psig and heating the resin to polymerize until hard;

g. reducing pressure slowly to atmospheric pressure; and
h. breaking out excess resin from the section and postcuring at an elevated temperature until the maximum mechanical modulus and strength is developed in the resin.

3,854,981
PROCESS FOR EMBEDDING OR ENVELOPING SOLID MATERIALS

Nikolaus Schon, Leverkusen; Hildegard Schnoring, Wuppertal-Elberfeld, and Gottfried Pampus, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 24,803, April 1, 1970, abandoned. This application Feb. 9, 1972, Ser. No. 224,938
Claims priority, application Germany, Apr. 5, 1969, 1917738
Int. Cl. B44d *1/44*
U.S. Cl. 117—62.1 **8 Claims**

1. Process for embedding or enveloping a solid or liquid in a polymer containing carboxy or carboxylate groups, said process comprising dispersing or dissolving said solid or liquid in an aqueous solution of said polymer, atomizing the resulting dispersion or solution to thereby form small spherical particles thereof and introducing said atomized particles into an aqueous solution of an aluminum salt to thereby crosslink said polymer and form solid envelopes about said particles and recovering resulting particles as a microgranulate.

3,854,982
METHOD FOR PREPARING HYDROPHILIC POLYMER GRAFTS INCLUDING IRRADIATION

Rene Aelion, Concord, and Edward Ferezy, Merrick, both of Mass., assignors to Hydroplastics, Inc., New York, N.Y.

Filed May 12, 1972, Ser. No. 252,622
Int. Cl. B44d *1/50;* **C08f** *3/50*
U.S. Cl. 117—68 **3 Claims**

1. A process for forming a hydrophilic polymeric surface on a substrate comprising coating a first surface of said substrate with a first monomer system comprising a hydroxyalkyl methacrylate and a crosslinking agent, coating a second surface of said substrate with a second monomer system then irradiating said coated substrate with high energy radiation whereby said first monomer system is grafted onto said substrate and forms a hydrophilic surface.

3,854,983
FLAMEPROOF COVERING MATERIAL, SUCH AS TICKING

John G. Brodnyan, Langhorne, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 255,880, May 10, 1972, abandoned. This application June 1, 1972, Ser. No. 258,758
Int. Cl. B05c *9/04*
U.S. Cl. 117—68 **12 Claims**

1. A cover fabric of composite-layer type comprising a light-weight woven or damask fabric, a soft, flexible layer adhered thereto formed of a crushed foam of a polymeric material and a metal-containing coating of about 0.5 to 4 oz./square yard composed of metal particles in a polymeric binder wherein the proportion of metal is at least 25 percent by weight of the binder on the crushed foam layer, the metal content of which serves to conduct heat rapidly through this layer.

3,854,984
VACUUM DEPOSITION OF MULTI-ELEMENT COATINGS AND FILMS WITH A SINGLE SOURCE

Harvey W. Schadler, Scotia, and John R. Rairden, III, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 209,359, Dec. 17, 1971, abandoned. This application Nov. 27, 1973, Ser. No. 419,285
Int. Cl. C23c *13/02*
U.S. Cl. 117—93.3 **8 Claims**

1. The method of vacuum evaporating and depositing on the surface of a turbine engine metal part a multi-element protective coating of substantially the composition of a single metallic alloy source, which comprises the steps of cutting a section from an ingot of said alloy and placing the ingot section in a chamber evacuated to a pressure of 10^{-3} to 10^{-4} torr, sweeping a focused electron beam of power density from 10^4 to 10^{10} watts per square inch back and forth across the surface of the ingot section at 60 cycles per second along a line on the ingot section surface one-half inch long, and exposing the turbine engine part to the combined evaporated components.

3,854,985
METHOD FOR APPLYING MASTIC PAINT COMPOSITIONS TO CONCRETE BASES

Yoshinori Suzuki, and Yukio Iwasaki, both of Tokyo, Japan, assignors to Kowa Chemical Industry Ltd., Tokyo, Japan

Filed June 9, 1972, Ser. No. 261,297
Int. Cl. B44d *1/02;* **C04b** *7/02*
U.S. Cl. 117—11 D **10 Claims**

1. Method for applying a mastic coating to a concrete base which comprises applying to said concrete base, with a porous hand roller in a one coat finish, a pasty paint composition comprising a mixture of (a) Portland cement, (b) an aggregate, (c) from about 1 to about 3 parts by weight of calcium chloride, (d) from about 0.4 to about 2 parts by weight of naphthalene sulfonic acid formalin condensate, (e) from about 1 to about 2 parts by weight of alkyl cellulose having a viscosity of about 4,000 cps, (f) from about 2 to about 5 parts by weight of propylene glycol, (g) from about 0.5 to about 10 parts by weight of calcium sulfoaluminate, (h) from about 5 to about 15 parts by weight of an efflorescence preventing agent consisting essentially of zeolite, (i) from about 0.1 to about 5 parts by weight of calcium stearate, and (j) from about 0.01 to about 0.2 part by weight of tributyl phosphate, all of said parts being based upon 100 parts of said Portland cement, and said aggregate being present in an amount of from about 100 to about 150 parts by weight.

3,854,986
METHOD OF MAKING MINERAL FIBERS OF HIGH CORROSION RESISTANCE AND FIBERS PRODUCED

Vaclav Chvalovsky, Praha; Lumir Mach, and Helena Machova, both of Ostrava, all of Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Praha, Czechoslovakia

Continuation-in-part of Ser. No. 762,615, Sept. 25, 1968, abandoned. This application Sept. 26, 1969, Ser. No. 861,471
Claims priority, application Czechoslovakia, Sept. 26, 1967, 6819-67
Int. Cl. C03c *25/02*
U.S. Cl. 117—126 GS **12 Claims**

1. Glass fibers coated with a polysiloxane resin wherein said glass fibers are formed of a glass having the following composition:

SiO_2	35–47%
Al_2O_3	5–18%
$FeO + Fe_2O_3$	2–15%
CaO	2–23%
MgO	1–30%
MnO	0–10%
$Na_2O + K_2O$	below 5%
TiO_2	1.5–10%
ZrO_2	0–5%
ZnO	0–5%
CaF_2	0–2%

the sum of CaO and MgO being between 14 and 38 percent and the sum of CaO, MgO, Al_2O_3 and SiO_2 being up to 90 percent of the total composition.

3,854,987

COATED STRUCTURAL UNITS HAVING IMPROVED PHYSICAL PROPERTIES

David H. Michael, deceased, late of 3210 Five Oaks Place, Louisville, Ky. 40207 (by Margaret C. Michael, legal representative)

Filed Jan. 2, 1973, Ser. No. 320,189
Int. Cl. C09d 1/02; B32b 13/04
U.S. Cl. 117—123 A 3 Claims

1. A structural unit of concrete or cinder block coated with a composition consisting essentially of an aqueous solution of an alkali metal silicate containing at least about 1.5 moles SiO_2 per mole Na_2O, a filler and a sodium tripolyphosphite wetting agent, wherein said filler is present in an amount of about one to about 100 percent by weight, based on the weight of said silicate and said wetting agent is present in an amount of about 0.5 to about 10 percent by weight, based on the weight of said silicate.

3,854,988

TREATMENT OF GLASS FIBRES

Ronald James Ashall, "Underly," Lime Vale Rd., Wigan, and David Ronald Bartlett, 89 Broadway, Eccleston St., Helens, both of England

Continuation of Ser. No. 161,344, July 9, 1971, abandoned. This application Mar. 7, 1973, Ser. No. 339,388
Int. Cl. C03c 25/00; C08g 51/24
U.S. Cl. 117—126 R 8 Claims

1. A method of bonding mineral wool products using a copolymer resin binder composition formed by

a. reacting urea with formaldehyde in an aqueous medium for between 30–75 minutes at an alkaline pH value and at a temperature of about 63°C to 67° C in the presence of an amine as a catalyst to form a composition containing a urea-formaldehyde reaction product;

b. acidifying the composition to an acid pH value by the addition of an acid;

c. adding furfuryl alcohol and polyethylene glycol to the acidified composition and reacting said alcohol and glycol with the urea formaldehyde reaction product for 2 to 5 hours to form the copolymer resin solution;

d. adjusting the pH of the solution to substantially neutral;

e. diluting the solution with water to such an extent that the composition does not take more than 150 seconds to gel at 150° C; and

f. contacting the mineral wool fibers with the diluted resin solution.

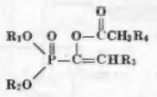
3,854,989

PROCESS FOR IMPARTING FLAME RESISTANCE TO TEXTILE MATERIAL

Peter Golborn, Lewiston, N.Y.

Division of Ser. No. 155,296, June 21, 1971. This application Dec. 1, 1972, Ser. No. 311,177
Int. Cl. C09k 3/28; C09d 5/18
U.S. Cl. 117—136 5 Claims

1. A flame resistant textile material comprising a textile material selected from the group consisting of cellulosic and proteinaceous material having applied thereto a flame retarding amount of a compound of the formula:



wherein

R_1 and R_2 are independently lower alkyl groups of one to eight carbon atoms;

R_3 is —H or a lower alkyl group of one to eight carbon atoms; and

R_4 is —H, —Cl or a lower alkyl group of one to eight carbon atoms.

3,854,990

PROCESS FOR SIZING TEXTILE MATERIALS

Albert E. Corey, East Longmeadow; Donald D. Donermeyer; Joe Fantl, both of Springfield, all of Mass., and Charles R. Williams, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 98,915, Dec. 16, 1970, Pat. No. 3,723,381. This application Feb. 5, 1973, Ser. No. 329,495
Int. Cl. C08j 1/44
U.S. Cl. 117—139.5 A 13 Claims

1. A method for sizing textile yarns to provide a water-resistant coating which comprises coating the textile yarn with a solution comprising the interpolymerization product of from 83 to 95 percent by weight of vinyl acetate, from 2 to 10 percent by weight of a dialkyl maleate selected from the group consisting of dimethyl maleate and diethyl maleate and from 3 to 7 percent by weight of acrylic acid based on the total weight of the monomers, and drying the coated textile yarn to remove solvent.

3,854,991

COATED CEMENTED CARBIDE PRODUCTS

Thomas E. Hale, Warren, Mich., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 11, 1972, Ser. No. 225,667
Int. Cl. C23c 11/14
U.S. Cl. 117—169 R 6 Claims

1. A coated cemented carbide product comprising

a cemented carbide substrate and

a fully dense coating selected from the group consisting of hafnium carbonitride, zirconium carbonitride and mixtures of the two, said coating firmly and adherently bonded to said substrate,

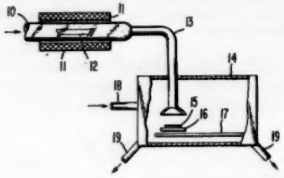
the hafnium carbonitride coating and the hafnium and zirconium carbonitride coatings having an X-ray diffraction lattice parameter within the range of about 4.570 to 4.630 angstrom units and the zirconium carbonitride coating having an X-ray diffraction parameter within the range of about 4.600 to 4.620 angstrom units.

3,854,992

PROCESS FOR DEPOSITING ELECTRICALLY CONDUCTIVE INDIUM OXIDE COATINGS ON A SUBSTRATE

James Kane, Affolter am Albis, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 15, 1973, Ser. No. 341,693
Int. Cl. C23c *11/08*; C03c *17/22*
U.S. Cl. 117—201 7 Claims



1. A process of depositing a film of indium oxide on an inert substrate that does not decompose during deposition of said film which comprises

a. vaporizing the indium chelate of 2,2,6,6-tetramethylheptane-3,5-dione at a temperature of from about 180°–250° C.,

b. heating said substrate to a temperature of from about 350°–550° C., and

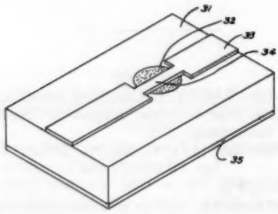
c. contacting said substrate with the chelate vapor in an oxygen-containing or water-containing atmosphere until a film of indium oxide is formed.

3,854,993

MICROWAVE CIRCULATOR

Douglas H. Harris, and Harold M. Correll, both of Dayton, Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Division of Ser. No. 205,875, Dec. 8, 1971,. This application Apr. 30, 1973, Ser. No. 356,255
Int. Cl. H01f *10/04*
U.S. Cl. 117—212 4 Claims



1. A microwave circulator comprising a co-planar substrate of

a. a dielectric substrate having a cavity therein, and

b. a magnetic material deposited by arc-plasma spraying techniques filling the cavity, and a metal coating on said coplanar substrate.

3,854,994

GAS ELECTRODES

Horst Binder, Heitzhoferstr. 6, Petterweil/Taunas; Alfons Kohling, Muhlstrasse 44, Niederhochstadt/Taunas, and Wolfgang Kuhn, Ahornstr. 44, Frankfurt-Griesheim, all of Germany

Filed Aug. 23, 1973, Ser. No. 390,841
Int. Cl. B44d *1/18*, *1/16*
U.S. Cl. 117—216 19 Claims

1. A method of making a porous electrode having an electrically conductive electrocatalytically active layer and a contiguous gas permeable hydrophobic layer comprising

filtering a first suspension comprising essentially polytetrafluoroethylene powder in propanol-(1), isopropanol, butanol, or dichloromethane, and withdrawing liquid therefrom to form a first porous layer comprising a matted and damp polytetrafluoroethylene filter cake,

placing a metal screen on the filter cake,

filtering a second suspension comprising essentially carbon powder, graphite fibers, and polytetrafluoroethylene powder in propanol-(1), isopropanol, butanol, or dichloromethane, by withdrawing liquid therefrom through the screen and the first layer to form a second porous layer on said screen and said first layer, and

heating the two-layer structure to at least about 330° C.

3,854,995

PROCESS FOR THE RECOVERY OF SUGARS FROM SPENT SULFITE LIQUOR

Jiro Okabe; Akira Machihara; Mutsumi Kaneyasu, and Kojiro Kato, all of Iwakuni, Japan, assignors to Sanyo-Kokusaku Pulp Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1973, Ser. No. 342,729
Int. Cl. C13k *1/00*, *9/00*
U.S. Cl. 127—43 3 Claims

1. A process for the recovery of sugars from spent sulphite liquor, comprising (a) incorporating a calcium base selected from the group consisting of calcium oxide and calcium hydroxide into a spent sulfite liquor in powder form, said base being in such an amount that a 5% aqueous solution of the resulting mixture will exhibit a pH of 7.6–11.0, (b) forming said aqueous solvent and (c) extracting the resulting aqueous solution containing said calcium base with a solvent selected from the group consisting of 75–96% C_1—C_4 alcohols and 75–96% C_1—C_4 ketones to recover sugars from said mixture.

3,854,996

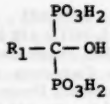
METHOD FOR REMOVING MAGNETITE SCALE

Jack G. Frost; John A. Knox, and Larry D. Martin, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

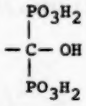
Filed Apr. 27, 1972, Ser. No. 248,278
Int. Cl. C02b *5/06*; C23g *1/06*
U.S. Cl. 134—2 14 Claims

1. A method for removing iron and copper containing scale from ferrous metal substrates comprising contacting for a period of at least one hour, at a temperature of from about 180°F to about 300°F, and at a pH of from about 9 to about 10.25, the scale bearing substrate with an aqueous solution consisting essentially of water and at least 0.5 weight percent of at least one compound selected from the class consisting of polyphosphonic acids (1) and (2), the amine salts of said polyphosphonic acids and the alkali metal salts of said polyphosphonic acids, acids (1) and (2) being structurally defined as follows:

(1)

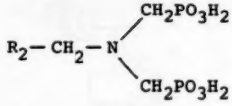


where R_1 is selected from the class consisting of C_1–C_{12} alkyl groups, and the group

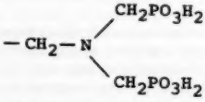


and

(2)



where R_2 is selected from the class consisting of —H,—PO_3H_2, C_1–C_{12} alkyl groups, and the group



said aqueous solution further including an oxidant compound capable of oxidizing ferrous ions to ferric ions and capable of oxidizing copper to cupric ions, said oxidant compound being present in said aqueous solution in an amount effective to oxidize all ferrous ions present in the solution to ferric ions, and all copper contacted by the solution to cupric ions.

3,854,997

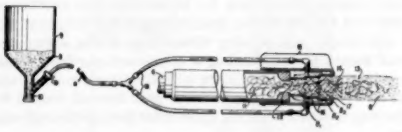
JET FLAME CLEANING

Clifford S. Peck, Elberton, Ga., and Clarence A. Garrison, Monroe, La., assignors to C. S. Peck Co., Inc., Elberton, Ga.

Division of Ser. No. 97,553, Dec. 14, 1970, Pat. No. 3,741,792. This application Apr. 10, 1973, Ser. No. 349,821

Int. Cl. B08b *5/02*; **B24c** *5/02*, *7/00*

U.S. Cl. 134—7 **4 Claims**



1. A method of cleaning a surface with abrasive material including the steps of:

a. producing a supersonic jet flame by combusting a fuel within a combustion chamber;

b. passing said flame through a venturi element positioned exteriorly of said combustion chamber, said element being in communication with a supply of said abrasive material;

c. introducing said abrasive material into said flame at circumferentially and axially spaced points relative to the flame passage and from a nonpressurized container by means of the vacuum created in said venturi element acting on said supply by the passage of said flame through said venturi element; and,

d. directing said abrasive material-carrying flame onto the surface to be cleaned.

3,854,998

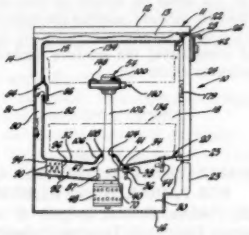
FLUID POWERED ULTRASONIC WASHING, RINSING, AND DRYING SYSTEM FOR A DISHWASHER

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1973, Ser. No. 392,932

Int. Cl. B08b *3/02*

U.S. Cl. 134—191 **4 Claims**



1. A dishwasher comprising; a casing defining a washing chamber having a sump and an access opening, a plurality of utensil supporting rack means secured to said dishwasher casing, a combination vapor-air blower and liquid supply pump including an inner liquid pump housing and outer vapor blower housing concentrically spaced therefrom so as to extend vertically upwardly from said sump, said inner housing enclosing a liquid circulating impeller and said outer housing enclosing vapor-air impeller, motive means for driving both said impellers, liquid passage means connecting said sump with said inner pump housing, vapor-air passage means connecting said washing chamber with said outer blower housing, means for distributing liquid in said chamber for washing dishes or the like, said liquid distributing means including a vertical column mounted on said blower outer housing and in fluid communication therewith, said column extending upwardly to a central part of said chamber, said column having an ultrasonic generator supported thereon, said generator including a lower dish-shaped plate having a concave surface facing upwardly, and an upper inverted dish-shaped plate positioned in concentric spaced relation above said lower plate, whereby a 360° Venturi nozzle opening is provided between the adjacent perimeters of said plates; a vertical liquid supply tube positioned within said column such that its lower end is in communication with said pump inner housing, upper and lower cup-shaped liquid distributor heads having their open ends in sealed contact with the central portion of said upper and lower plates respectively, providing upper and lower liquid distributing cavities; said upper and lower heads concentrically supported on said upper and lower plates respectively, the curved outer surfaces of which form secondary dome-like reflecting surfaces, means for supplying liquid to each of said distributor cavities from said liquid supply tube, each said distributor head having apertures therein for directing liquid spray into said washing chamber, a ring fixedly mounted in outwardly spaced concentric relation with respect to said upper and lower plates such that said ring is symmetrically located with respect to a horizontal plane bisecting said Venturi nozzle, said ring having its inner annular face providing a primary reflecting surface in opposed facing relation with said Venturi nozzle such that ultrasonic vapor-air waves emitted by said Venturi nozzle are reflected from said ring primary surface onto said secondary upper and lower reflecting surfaces whereby ultrasonic vapor-air waves are directed outwardly in conjunction with said liquid spray into said washing chamber for impinging on utensils being cleaned in said racks.

3,854,999

MERCURIC OXIDE ELECTRODE AND METHOD OF FORMING

Roy F. Thornton, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1972, Ser. No. 302,798

Int. Cl. H01m *35/02*

U.S. Cl. 136—20 5 Claims

1. A method of forming a mercuric oxide electrode comprises mixing together mercuric oxide powder and silver powder, prepressing the powder mixture, grinding the mixture adding 0.5 to 2.0 parts by weight of wax to the mercuric oxide-silver powder mixture, placing the mixture in a pressing die, positioning at least one mesh current collector on the mixture, and compacting the mixture against the collector thereby forming an electrode.

3,855,000

AIR DEPOLARIZATION PRIMARY CELL AND PROCESS FOR PRODUCTION THEREOF

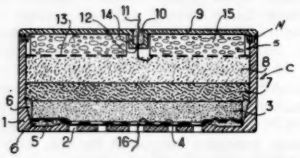
Jean Jammet, Poitiers, France, assignor to Saft-Societe Des Accumulateurs Fixes et de Traction, Ramainville, France

Filed Oct. 26, 1972, Ser. No. 300,907

Claims priority, application France, Oct. 29, 1971, 71.39027

Int. Cl. H01m *29/04*

U.S. Cl. 136—86 A 23 Claims



1. An air depolarization unitary primary cell of the type comprising a tubular casing of non-conductive material, a porous positive electrode, an immobilized alkaline electrolyte and an expandible negative electrode based on zinc arranged in superposed layers and disposed in said tubular casing, all of said layers extending transversely of the longitudinal axis of said casing, means for sealing said cell in fluid-tight manner relative to liquids within the cell at one end thereof, said means comprising a hydrophobic impregnant in pores of said positive electrode, said positive electrode being adhesively secured in said container adjacent said one end, said one end having at least one opening for providing access of air to the positive electrode while blocking exit of said liquids via said positive electrode, means at the opposite end of said casing including a cover carrying a negative terminal, means connecting said terminal with said negative electrode, said cover being securely sealed to said casing at said opposite end, said layers being disposed in said casing to provide a space for expansion of the negative electrode between the latter and the cover, means within said space between said cover and said negative electrode to maintain said layers under pressure and in intimate surface contact irrespective of expansion of the negative electrode during use of the cell.

3,855,001

FUEL CELL WITH AIR PURIFIER

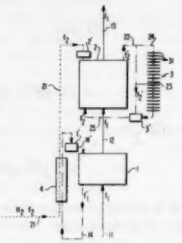
Jacques Cheron, Versailles, France, assignor to Institut Francois du Petrole des Carburants et Lubrifiants, Rueil-Malmaison (Hauts-de-Seine), France

Continuation-in-part of Ser. No. 125,208, March 17, 1971, abandoned. This application Apr. 18, 1973, Ser. No. 352,350

Claims priority, application France, Mar. 26, 1970, 70.11082

Int. Cl. H01m *27/14*

U.S. Cl. 136—86 C 11 Claims



1. A fuel cell comprising a cell block forming the hot part of the fuel cell, said cell block having inlet and outlet means for the purpose of introducing into said fuel cell block and evacuating therefrom at least one comburent, one fuel, and an electrolyte, duct means connected to said inlet means for supplying respectively said cell block with comburent, fuel and electrolyte, a comburent purifier constituting the cold part of said fuel cell, said cell block being placed above and substantially straight above said comburent purifier, said comburent purifier comprising a housing in which there are placed a plurality of vertical tubes having predetermined inside diameters and lengths, and whose inside surfaces are covered with a porous material, the upper ends of these tubes being located at the same level in said housing which forms around said tubes a reservoir for containing a liquid for purifying the comburent, said housing being provided at the lower part thereof, with means for introducing the comburent exclusively into said tubes and, at the upper part thereof, with means for evacuating the purified comburent and putting in communication the upper ends of said tubes with said duct means for supplying said fuel cell block with comburent, said duct means being substantially rectilinear and placed vertically so as to directly connect the means for evacuating said comburent purifier and the means for introducing said comburent into said cell block, said housing comprising at the upper part thereof means for introducing a comburent-purifying liquid whose level is maintained even with the upper ends of said tubes and comprising, at the lower part thereof, means for evacuating the used purifying liquid after passage through said tubes.

3,855,002

LIQUID ELECTROLYTE FUEL CELL WITH GAS SEAL

Craig R. Schroll, West Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 21, 1973, Ser. No. 427,181

Int. Cl. H01m *27/02*

U.S. Cl. 136—86 R 2 Claims

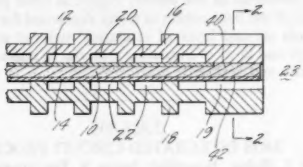
1. A fuel cell assembly for fuel cells utilizing gaseous reactants and a liquid electrolyte which comprises:

a pair of gas-porous fuel cell electrodes each having an inner and outer surface, the inner surface comprising a catalytic layer, one electrode being positioned to extend beyond the other;

an electrolyte-saturated matrix sandwiched between the inner surfaces of the electrodes and in contact therewith, the matrix having an end portion substantially coexten-

sive in length with a first of the electrodes and extending beyond the second of the electrodes;

and a pair of gas separators, one positioned outwardly of each electrode defining a first gas space between the first of the electrodes and one separator and a second gas space between the second of the electrodes and the other separator, the surface of the separator confronting the first of the electrodes being formed with a gas passageway



therein between the first gas space and the exterior of the cell assembly, the matrix being sandwiched between the ends of the separators in direct contact with the separator adjacent the second electrode, the first electrode being interposed between the matrix and the other separator;

the electrolyte in the matrix forming a wet seal between the matrix and the separator adjacent the second electrode preventing the escape of gas thereby.

3,855,003

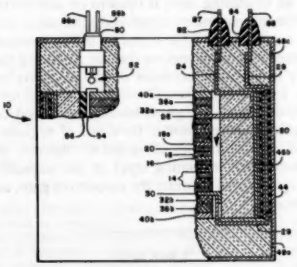
THERMAL SENSING, FIRE SAFING DEVICE FOR A THERMAL BATTERY

Donald M. Bush, Tijeras, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.

Filed Jan. 2, 1974, Ser. No. 430,313

Int. Cl. H01m *21/14*

U.S. Cl. 136—83 T **10 Claims**



1. In a thermal battery comprising a casing; a plurality of electrical battery cells within said casing, thermal insulation positioned about said battery cells between said battery cells and said casing and a pair of terminals normally electrically isolated from each other, the improvement in combination therewith comprising a heat sensing means for preventing thermal battery electrical output in response to application of external heat, said heat sensing means comprising short circuiting means having low melting temperature material disposed between said thermal insulation and said casing for melting and electrically interconnecting portions of said terminals upon application of sufficient heat from exterior of said thermal battery.

3,855,004

METHOD OF PRODUCING CURRENT WITH CERAMIC FERROELECTRIC DEVICE

Philip S. Brody, Brookmont, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 1, 1973, Ser. No. 411,853

Int. Cl. H01l *15/02*

U.S. Cl. 136—89 **2 Claims**

1. A method for producing current in direct proportion to intensity of light comprising

applying an electric voltage of predetermined magnitude to a polycrystalline ferroelectric ceramic for a predetermined time to pole the polycrystalline ferroelectric ceramic,

removing the applied voltage,

disposing two electrodes in conductive contact with the polycrystalline ferroelectric ceramic,

attaching an electrical lead to each electrode,

connecting a low resistance between the two leads,

impinging light having a certain intensity upon the polycrystalline ferroelectric ceramic, and

producing current through the resistance which is in direct proportion to the intensity of the light impinged upon the polycrystalline ferroelectric ceramic.

3,855,005

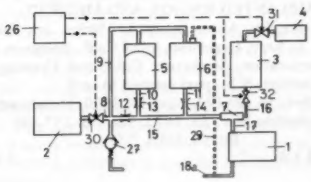
DEVICE IN A GALVANIC BATTERY FOR REMOVING AIR FROM THE ELECTROLYTE AND WATER SUPPLY DUCTS AND FROM THE ELECTROLYTE TANK WHEN THE BATTERY IS STARTED

Esko Ensio Huhta-Koivisto, Helsinki, Finland, assignor to Puolustusministerio, Helsinki, Finland

Filed Oct. 16, 1972, Ser. No. 297,954

Int. Cl. H01m *1/06*

U.S. Cl. 136—100 R **6 Claims**



1. In combination with a galvanic battery having a cell system consisting of bipolar electrode plates, a device for removing air from the battery, said device comprising an electrolyte inlet duct connected with said cell system, a venting valve connected with said inlet duct, a second duct connected to one side of said venting valve, a third duct connected to another side of said venting valve, a first valve connected with said third duct, an initial electrolyte tank connected with said first valve, a second valve connected with said initial electrolyte tank, a pressure source connected with said second valve, a second electrolyte tank, means connecting said second and third tanks at a spaced interval to said second duct, a water supply duct connected with the second and third tanks, whereby electrolyte consisting of water and an electrolyte component is supplied to said cell system, and a two-position valve device connected with said second duct, said water supply duct and said first and second valves and having movable valve members movable under initial electrolyte pressure into a first position wherein initial electrolyte flow passes through said inlet duct and said first and second valves open into said second duct, said movable valve members being movable under electrolyte pressure into a second position wherein said third duct and said first and second

valves are closed and electrolyte proper flows through the inlet duct.

3,855,006

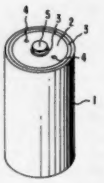
HIGH ENERGY DENSITY BATTERY HEAT FUSIBLE VENTING MEANS

Matthew Roland Kegelman, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 180,379, Sept. 14, 1971, abandoned. This application Aug. 1, 1973, Ser. No. 384,500

Int. Cl. H01m 1/06

U.S. Cl. 136—177 **4 Claims**



1. In a galvanic battery comprising a lithium anode, a depolarizing cathode in an oxidation state high in relation to lithium and an electrolyte comprising a combustible organic solvent and a solute enclosed in an atmospherically sealed battery case, the improvement comprising at least one electrolyte expulsion vent incorporated into the sealed battery case having a thermally fusible metal vent plug that melts at a preselected temperature below the temperature at which the battery case would violently rupture due to heat and pressure, whereby the electrolyte is vented from the battery case.

3,855,007

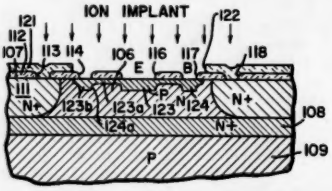
BIPOLAR TRANSISTOR STRUCTURE HAVING ION IMPLANTED REGION AND METHOD

Bohumil Polata, Los Altos; James A. Marley, Jr., Saratoga, and John T. Kerr, Cupertino, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif. and Corning Glass Works, Corning, N.Y., part interest to each

Division of Ser. No. 89,193, Nov. 13, 1970, abandoned. This application Mar. 23, 1972, Ser. No. 237,340

Int. Cl. H01l 7/54

U.S. Cl. 148.1.5 **3 Claims**



1. In a method for fabricating a semiconductor device within a semiconductor body of one conductivity type having a planar surface and using ion implantation, forming an insulating layer on said surface, forming simultaneously a plurality of spaced openings in said insulating layer and exposing said surface in said openings with at least one openings for the base and at least one opening for the emitter, covering the emitter opening and the portions of insulating material surrounding the base but with portions of the insulating material overlying the base being exposed with a protective material of sufficient thickness to prevent any substantial penetration by the ion beam used for ion implantation, uncovering the base opening, implanting ions of an impurity of opposite conductivity type through the uncovered opening to form a base region of opposite conductivity type extending to said surface and having portions extending to different depths from said surface, covering the base opening with a protective material to prevent any substantial penetration by the ion beam, removing the protective material from the emitter opening, implanting ions of an impurity of said one conductivity type into said emitter opening from which the protective material has been removed to form an emitter region of said one conductivity type extending to the surface within the base region and with the outer perimeter of the emitter region in close proximity to a portion of the base region of lesser depth and forming contact elements on said layer of insulating material and extending through said layer of insulating material to make contact with said base and emitter regions.

3,855,008

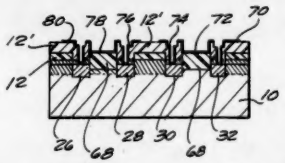
MOS INTEGRATED CIRCUIT PROCESS

Robert J. Huber, Bountiful; James N. Fordemwalt, and Kent F. Smith, both of Salt Lake City, all of Utah, assignors to General Instrument Corporation, Newark, N.J.

Filed Aug. 30, 1973, Ser. No. 392,971

Int. Cl. H01l 7/54

U.S. Cl. 148—1.5 **4 Claims**



1. In a method of simultaneously forming a pair of transistors, one of which is operative in a first mode and the second of which is operative in a second mode, on a single substrate of a first conductivity type wherein each of the transistors has a pair of second conductivity type source and drain regions separated by a channel region at a surface of said substrate and where an insulating layer is present on said surface of the substrate, the improvement comprising the steps of introducing a first conductivity type impurity in the substrate at the surface except in certain regions therein, reducing the amount of impurity in selected portions of the impurity containing regions to form a first set of regions having no impurity therein, a second set of regions having a reduced concentration of impurity therein and a third set of regions having a nonreduced concentration of impurity therein, producing contact holes in the insulating layer of the respective source and drain regions, and forming the respective gate, source and drain electrodes.

3,855,009

ION-IMPLANTATION AND CONVENTIONAL EPITAXY TO PRODUCE DIELECTRICALLY ISOLATED SILICON LAYERS

William W. Lloyd, and Richard J. Dexter, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 20, 1973, Ser. No. 399,034

Int. Cl. H01l 7/54

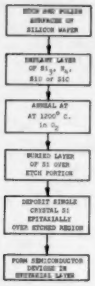
U.S. Cl. 148—1.5 **18 Claims**

1. A method of dielectrically isolating silicon layers which comprises the steps of:

a. providing a wafer of single crystal silicon,

b. implanting ions taken from the class consisting of oxygen, nitrogen and carbon at a predetermined depth in said wafer,

c. forming a layer of a compound of said implanted ions with the silicon of said wafer within said wafer, leaving single crystal silicon above said layer, and



d. epitaxially depositing single crystal silicon over said layer.

3,855,010
COMPOSITION AND METHOD FOR COLOR PASSIVATION OF ZINC AND CADMIUM

Romas Romovich Sharmaitis, ulitsa Antakalne, 93, kv. 24; Valentina Alexeevna Vilutene, ulitsa Zhvaigzhdju 4, kv. 243, and Juozas Juozovich Matulis, ulitsa Maloneii 11, kv. 1, all of Vilnjus, U.S.S.R.

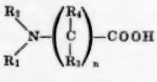
Filed Dec. 29, 1972, Ser. No. 319,391

Claims priority, application U.S.S.R., Apr. 5, 1972, 1762901

Int. Cl. C23f *7/26*

U.S. Cl. 148—6.21 **12 Claims**

1. A composition for the color passivation of zinc and cadmium consisting essentially of a mixture of hexavalent chromium compounds selected from the group consisting of chromic anhydride and soluble chromates, and soluble nitrate compounds, soluble sulphate compounds, soluble boron compounds, and an amino acid of the general formula:



where R_1, R_2, R_3, R_4 = —H, alkyl (C_1–C_8), phenyl, substituted alkyls and phenyls, containing substituents —OH, —R, —COR, —COOH, —COOR, —$CONH_2$, —CN_1, —NH_2, —NHR, —RNR, (R = alkyl, and aryl), $n = 1 - 5$, said composition having the following content of the above components (in weight parts):

hexavalent chromium compound (calculated as chromium)	1.7–70.0
nitrate compound (calculated as NO_3^-)	1.0–45.0
sulphate compound (calculated as SO_4^{2-})	1.0–25.0
boron compound (calculated as boron)	0.5–10.0
amino acid	0.05–6.0

3,855,011
METHOD FOR CONTROLLING HEAT EFFECT IN METAL CUTTING OPERATIONS

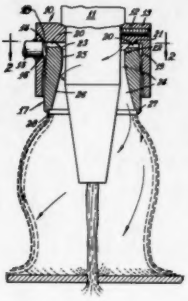
Charles A. Van Horn, Country Club Hills, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Division of Ser. No. 211,217, Dec. 23, 1971, Pat. No. 3,815,883. This application Nov. 14, 1973, Ser. No. 415,839

Int. Cl. B23k *7/00*

U.S. Cl. 148—9 R **3 Claims**

1. A method of cutting a metal workpiece comprising the steps of heating a portion of the metal workpiece, impinging a jet of gas on the heated portion, generating a swirling annular sheet or film of liquid coolant about the jet of gas and directing said sheet or film of coolant onto the metal workpiece about the locus of the impingement of the jet of gas, so that the sheet or film of coolant spreads intact outwardly over the surface of the metal workpiece.



3,855,012
PROCESSING COPPER BASE ALLOYS

Stanley Shapiro, New Haven, and Ronald N. Caron, Branford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 1, 1973, Ser. No. 402,127

Int. Cl. C22f *1/08*

U.S. Cl. 148—11.5 R **6 Claims**

1. A method for improved yield strength characteristics in copper or copper base alloys which comprises:

A. providing a copper base alloy selected from the group consisting of the phosphor bronzes and copper alloys containing from 1–5% iron, in plate form having a thickness of from 0.300 to 1.800 inches;

B. cold rolling said material in at least three cold rolling cycles to a total reduction of at least 70% with an intermediate heat treatment of from 100° to 350°C for from 1 to 4 hours between each cold rolling cycle, provided that the rolling reduction in each cold rolling cycle is at least 25% and

C. subjecting said material to a final heat treatment after the last cold rolling cycle, said final heat treatment being at 100° to 350°C for from 30 minutes to 8 hours.

3,855,013
QUICK HEAT TREATMENT OF STEELS

Janos Prohaszka; Rudolf Welesz, and Andor Mandoki, all of Budapest, Hungary, assignors to Licencia Talalmanyokat Ertekesito Vallalat

Filed Mar. 5, 1973, Ser. No. 337,910

Claims priority, application Hungary, Mar. 7, 1972, PO 510

Int. Cl. C21d *1/40*

U.S. Cl. 148—12 R **6 Claims**

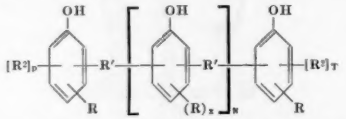
1. A process for the rapid heat treatment of cold worked steel, comprising heating the steel at the rate of at least 50°C. per second to a temperature above the austenitic transformation temperature, holding the steel at said temperature for a time at most 300 seconds to recrystallize the ferrite without substantial dissolution of the carbides present in the steel, and quenching the steel from said temperature to a temperature below the austenitic transformation temperature to prevent the occurence of austenitic transformation and carbide precipitation.

3,855,014
QUENCHING OIL COMPOSITION AND METHOD OF QUENCHING METAL

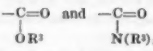
Donald L. De Vries, South Holland, and Barnard C. Creech, Homewood, both of Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 25, 1973, Ser. No. 373,530
Int. Cl. B23k *35/24*
U.S. Cl. 148—28 **19 Claims**

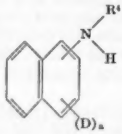
1. A quenching oil composition comprising a major amount of quench oil of lubricating viscosity having a minimum flash point of at least about 250°F., a minor amount sufficient to improve the anti-staining properties of said composition of at least one metal phenate compound of a phenolic component having the following structure



wherein each R is independently selected from the group consisting of monovalent essentially hydrocarbon radicals containing from about 3 to about 20 carbon atoms, each R′ is independently selected from the group consisting of divalent essentially hydrocarbon radicals containing from 1 to 5 carbon atoms and a carbonyl group, each R^2 is independently selected from the group consisting of non-interferring hydrocarbon radicals containing up to about 20 carbon atoms, non-interferring non-hydrocarbon radicals,



wherein R^5 is selected from the group consisting of hydrogen and monovalent essentially hydrocarbon radicals containing up to about 5 carbon atoms and mixtures thereof, *n* is an integer from zero to about 6 and P, X and T are each integers from zero to 3; and a minor amount sufficient to improve the resistance to oxidation of said composition of at least one naphthyl amine having the following structure



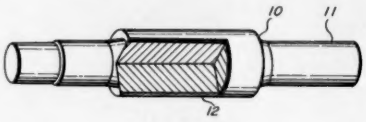
wherein R^4 is selected from the group consisting of hydrogen and monovalent hydrocarbon radicals containing from 1 to about 30 carbon atoms, *a* is an integer from zero to 7, and D is a monovalent hydrocarbon radical containing from 1 to about 30 carbon atoms.

3,855,015
WORK ROLL FOR HOT ROLLING

Tadashi Nemoto, Takahagi; Kiyoshi Watanabe, Hitachi; Tadaaki Kobayashi, Hitachi; Joo Ishihara, Hitachi; Kenji Ono, Tokyo, and Kazuhiko Sonomoto, Kitakyushu, all of Japan, assignors to Hitachi, Ltd. and Hitachi Metals, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 66,406, Nov. 3, 1970, abandoned. This application May 4, 1972, Ser. No. 250,186
Claims priority, application Japan, Nov. 4, 1969, 44-87559
Int. Cl. C04b *35/00*; **B32b** *15/00*
U.S. Cl. 148—34 **9 Claims**

1. A work roll for use in hot rolling of a steel comprising a body portion composed of a steel having a ferrite structure and having a yield strength of at least 40 Kg/mm², and a working layer of weld metal welded by submerged arc welding on the surface of said body portion, said working layer having a smooth surface and having a thickness of 7 to 50 mm, said working layer consisting essentially of 0.2 to 0.8 wt% of C, 4 to 10 wt% of Cr, 1 to 4 wt% of Mo, 0.5 to 5 wt% of V, 0.1 to 1.5 wt% of Si, 0.1 to 3 wt% of Mn, up to 0.5 wt% of Ni, up to 0.015 wt% of P, up to 0.015 wt% of S, at least one of 0.01 to 0.5 wt% of Ti and 0.05 to 1 wt% of Al, and the balance of



substantially Fe, said components other than Ti and Al showing a hot crack sensitivity value of 2.7 or less when calculated according to the formula,

$$C(P+S+Si/25+Ni/30)/3Mn+Cr+Mo+V \times 10^5$$

and said working layer having a structure comprising carbide particles distributed in a martensite matrix produced by maintaining said working layer at a temperature at which it is capable of forming an austenite structure and thereafter cooling said working layer.

3,855,016
ACICULAR COBALT POWDERS HAVING HIGH SQUARENESSS RATIOS

John E. Ehrreich, Wayland, and Adrian R. Reti, Cambridge, both of Mass., assignors to Graham Magnetics, Inc., Graham, Tex.

Continuation of Ser. No. 127,514, March 24, 1971, abandoned. This application June 28, 1973, Ser. No. 374,337
Int. Cl. H01f *1/04*
U.S. Cl. 148—31.57 **4 Claims**

1. A ferromagnetic composition formed of a mass of acicular metallic particles having an average miniumum length of 0.1 microns and a maximum average diameter of 2 microns and comprising at least 43 percent by weight of cobalt, said mass having a coercive force of at least 600 oersteds; a sigma value of from 75 to 120 e.m.u. per gram; and a squareness characteristic of from 0.4 to 0.5.

3,855,017
POWDERIZED COBALT RARE EARTH METAL COMPOUNDS AND PROCESS FOR MAKING SUCH COMPOUNDS

Claus Schueler, Widen, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed May 2, 1972, Ser. No. 249,538
Claims priority, application Switzerland, June 15, 1971, 8686/71
Int. Cl. H01f *1/02*
U.S. Cl. 148—105 **5 Claims**

1. In a process for producing powdered $SmCo_5$ from a mixture of reaction components of cobalt and samarium by a gas transport reaction in a reaction vessel; the improvement comprising introducing into said reaction vessel as a reaction material powdered cobalt having a grain size of up to 100μ and samarium comminuted to pieces of up to and including millimeter size, whereby the proportions of samarium and cobalt are such that the stoichiometric ratio of 5:1 in the end product $SmCo_5$ is assured, introducing grinding weights of suitable size into said reaction vessel, said grinding weights being of a material selected from the group consisting of W, Mo and Ta, evacuating and sealing the reaction vessel, keeping said reaction vessel in motion for a period of from a few hours to several days while simultaneously heating the reaction material and grinding weights to a temperature within the

range of about 750° to 1150°C, and then cooling and opening said reaction vessel to obtain said powdered $SmCo_5$.

3,855,018
METHOD FOR PRODUCING GRAIN ORIENTED SILICON STEEL COMPRISING COPPER

James A. Salsgiver; Gerald L. Houze, Jr., and Stuart L. Ames, all of Sarver, Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 293,194, Sept. 28, 1972, abandoned. This application May 7, 1973, Ser. No. 357,969
Int. Cl. H01f *1/04*
U.S. Cl. 148—112 **5 Claims**

1. In a process for producing oriented silicon steel including the step of preparing a melt of steel and casting same into ingots, hot rolling said ingots to hot rolled band gauge and subsequently cold rolling and annealing, as desired to produce silicon steel with cube-on-edge orientation, the improvement which comprises preparing a melt of steel having a composition consisting essentially of:

Carbon	.02 — .07%
Manganese equivalent (%Mn + (0.1 to 0.25) + %Cu)	.05 — .24%
Sulfur	.01 — .05%
Silicon	2.5 — 3.5%
Aluminum	.015 — .04%
Nitrogen	+- 90 parts per million
Copper	0.1 to 0.3%
Iron	Balance

and wherein the ratio of manganese equivalent to sulfur, by weight, is in the range of 2.0 to 4.75, and thereafter processing said steel to produce grain oriented steel with cube-on-edge texture whereby said oriented steel has a permeability of at least 1850 at 10 oersteds due to a duplex sulfide and nitride primary grain growth inhibition system, said system resulting from the aforementioned chemistry of the steel processed; said processing including the step of subjecting said hot rolled band to a temperature above 1400°F for 10 seconds to 30 minutes, said hot rolled band heat treatment contributing to the attainment of said high permeability for said oriented silicon steel.

3,855,019
PROCESSING FOR HIGH PERMEABILITY SILICON STEEL COMPRISING COPPER

James A. Salsgiver, Sarver, and Frank A. Malagari, Freeport, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed May 7, 1973, Ser. No. 357,973
Int. Cl. H01f *1/04*
U.S. Cl. 148—112 **6 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1850 (G/O_e) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel consisting essentially of, by weight, up to 0.07% carbon, from 2.60 to 4.0% silicon, from 0.03 to 0.24% manganese, from 0.01 to 0.07% sulfur, from 0.015 to 0.04% aluminum, up to 0.02% nitrogen, from 0.1 to 0.5% copper and the balance iron; casting said steel; hot rolling said steel into a hot rolled band; annealing said hot rolled band; cold rolling said annealed hot rolled band; decarburizing said steel; and final texture annealing said steel; the improvement comprising the steps of annealing the hot rolled band at a temperature of from 1400° to 1700°F for a period of from 15 seconds to 2 hours; cooling said annealed hot rolled band at a rate equivalent to a steel air cool, said cool including those wherein the steel is cooled in a static atmosphere or in a continuous processing line where there is some relative motion between the atmosphere and the steel, and excluding furnace cools and those where relative motion is deliberately induced for cooling purposes and cold rolling the cooled steel at a reduction of at least 80% in a single cold rolling.

3,855,020
PROCESSING FOR HIGH PERMEABILITY SILICON STEEL COMPRISING COPPER

James A. Salsgiver, Sarver, and Frank A. Malagari, Freeport, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed May 7, 1973, Ser. No. 357,974
Int. Cl. H01f *1/04*
U.S. Cl. 148—112 **18 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1850 (G/O_e) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel; casting said steel; hot rolling said steel into a hot rolled band; subjecting said steel to at least one cold rolling; subjecting said steel to a final annealing prior to the final cold rolling; decarburizing said steel; and final texture annealing said steel; the improvement comprising the steps of carrying out said final anneal prior to the final cold rolling at a temperature of from 1400° to 2150°F for a period of from 15 seconds to 2 hours; cooling said steel from a temperature below 1700°F and above 750°F to a temperature at least as low as 500°F with a liquid quenching medium or gaseous stream and from its maximum annealing temperature to said temperature below 1700°F and above 750°F at a rate which is no faster than one wherein the steel is cooled in a static atmosphere or in a continuous processing line where there is some relative motion between the atmosphere and the steel, although the only deliberate motion is that imparted to the steel; and cold rolling the cooled steel at a reduction of at least 80 percent; said melt consisting essentially of, by weight, up to 0.07% carbon, from 2.60 to 4.0% silicon, from 0.03 to 0.24% manganese, from 0.01 to 0.07% sulfur, from 0.015 to 0.04% aluminum, up to 0.02% nitrogen, from 0.1 to 0.5% and the balance iron.

3,855,021
PROCESSING FOR HIGH PERMEABILITY SILICON STEEL COMPRISING COPPER

James A. Salsgiver, Sarver, and Frank A. Malagari, Freeport, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed May 7, 1973, Ser. No. 358,238
Int. Cl. H01f *1/04*
U.S. Cl. 148—112 **12 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation and a permeability of at least 1850 (G/O_e) at 10 oersteds, which process includes the steps of: preparing a melt of silicon steel consisting essentially of, by weight, up to 0.07% carbon, from 2.60 to 4.0% silicon, from 0.03 to 0.24% manganese, from 0.01 to 0.07% sulfur, from 0.015 to 0.04% aluminum, up to 0.02% nitrogen, from 0.1 to 0.5% copper and the balance iron; casting said steel; hot rolling said steel into a hot rolled band; cold rolling said hot rolled band with or without an intermediate anneal between said hot rolling and said cold rolling, said intermediate anneal being at a maximum temperature of 1700°F; subjecting said band to at least one additional cold rolling; subjecting said band to a final annealing prior to the final cold rolling; decarburizing said steel; and final texture annealing said steel; the improvement comprising the steps of carrying out said final anneal prior to the final cold rolling at a temperature of from 1400° to 1700°F for a period of from 15 seconds to 2 hours; cooling said annealed steel at a rate equivalent to a still air cool, said cool including those wherein the steel is cooled in a static atmosphere or in a continuous processing line where there is some relative motion between the atmosphere and the steel, and excluding furnace cools and those where relative motion is deliberately induced for cooling purposes; and cold rolling said cooled steel at a reduction of at least 80 percent.

3,855,022

PARTICULATE ALUMINUM HYDRIDE WITH NITROCELLULOSE COATING SUITABLE FOR USE IN SOLID PROPELLANTS

James P. Flynn, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 14, 1965, Ser. No. 457,252
Int. Cl. C06d 5/06
U.S. Cl. 149—8 3 Claims

1. A substantially non-solvated particulate aluminum hydride having a surface coating of nitrocellulose.

3,855,023

MANUFACTURE OF MASKS

Denis F. Spicer, and Andrew C. Rodger, both of Bedford, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 180,776, Sept. 15, 1971, abandoned. This application Aug. 21, 1973, Ser. No. 390,275
Int. Cl. C23f 1/07
U.S. Cl. 156—11 9 Claims

1. A method for generating metal patterns on substrates comprising the steps of:

a. forming reference markings at a surface of a substrate:

b. coating said surface and said markings with a layer of electron beam sensitive resist;

c. scanning the reference markings in a first controlled manner with an electron beam to generate correction signals for alignment;

d. deflecting said electron beam in response to deflection signals representing the desired metal pattern, said deflection of the electron beam being positionally corrected by said correction signals for alignment to scan the electron beam sensitive resist in a second controlled manner with said electron beam to effect electron beam exposure of selected portions of said electron beam sensitive resist such that said exposed portions thereof are aligned with respect to said reference markings;

e. removing said exposed portions of electron beam resist to define a pattern therein corresponding with said desired metal patterns aligned with respect to said reference markings;

f. coating said patterned electron beam resist with a metal layer; and

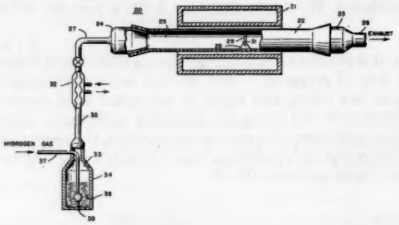
g. removing the unexposed portions of said electron beam resist together with portions of said metal layer of mask material overlying said unexposed portions of resist thereby leaving a desired metal pattern defined in said metal layer.

3,855,024

METHOD OF VAPOR-PHASE POLISHING A SURFACE OF A SEMICONDUCTOR

Mahn-Jick Lim, Lower Makefield Township, Bucks Cty., Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 194,324, Nov. 1, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 303,746
Int. Cl. H01l 7/50; C09k 3/00
U.S. Cl. 156—17 8 Claims



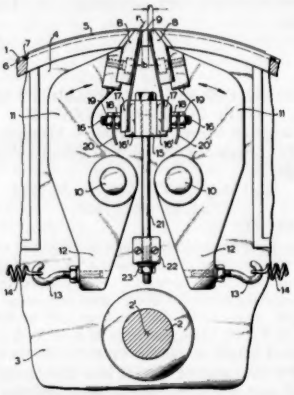
1. A method of polishing a surface of a substrate comprising a semiconductor material, which comprises, contacting the surface of the substrate, maintained at a suitable temperature, with a gaseous mixture comprising a carrier gas and water vapor for a period of time sufficient to polish the surface.

3,855,025

WELDING CYLINDER WITH PERIPHERALLY EXTENDING WELDING BAND

Frank Bosse, Ibbenburen-Dorenthe, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed May 10, 1973, Ser. No. 359,001
Claims priority, application Germany, May 18, 1972, 2224317
Int. Cl. B32b 31/00; H05b 1/00
U.S. Cl. 156—582 4 Claims



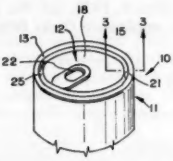
1. A rotary welding cylinder for welding thermoplastic film passed thereabout along a seam extending circumferentially of the cylinder, comprising a cylinder mounted for rotation, a welding band extending around said cylinder, rotatable therewith and held on the periphery of said cylinder under tension, said cylinder defining a radially extending recess with the ends of said band extending into said recess, the transition between said cylinder periphery and said recess being defined by rounded-off edges, a pivotally mounted tensioning jaw defining at least one of said rounded-off edges and being movable

in the circumferential direction of the cylinder, means securing the ends of said band in said recess to be non-yielable radially of the cylinder, and resilient means biasing said tensioning jaw to maintain said band under tension on the periphery of said cylinder.

3,855,026
METHOD OF MANUFACTURING CONTAINER END WITH PROTECTIVE BEAD

James D. Fox, Darlington; Earl P. Norman, Jr., and Jerry F. Sansbury, both of Hartsville, all of S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Division of Ser. No. 162,379, July 14, 1971, Pat. No. 3,754,678. This application Feb. 26, 1973, Ser. No. 335,992
Int. Cl. B29c 27/00
U.S. Cl. 156—69 **4 Claims**

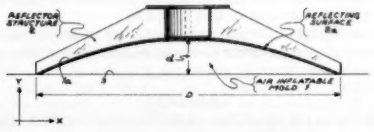


1. The method of making a container comprising: forming a container end of the easy opening type; applying a compound to said end for sealing thereof to a container body; pressing said end to form the tab and score line; preheating said end; applying hot melt material across said score line; building a container body; and seaming said end to said body; whereby a container is provided which has a protective shield on both the sharp edge of the removed portion and the residual lip portion remaining after removal of the removable portion.

3,855,027
ON-SITE FABRICATION OF ANTENNAS

Manfred O. Erdmann, and John J. Dolan, both of Denville, N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 22, 1972, Ser. No. 265,365
Int. Cl. B29d 27/04; B29g 7/02; B32b 31/12
U.S. Cl. 156—79 **24 Claims**



1. A method for fabricating an antenna reflector having a reflector surface of predetermined parameters, comprising the steps of:

a. applying to a mold surface having a curvature corresponding to the predetermined parameters of the reflector surface a continuous layer of polyester material of predetermined thickness;

b. applying a first layer of material comprising a fiber-reinforced resinous laminate to a predetermined thickness;

c. embedding into place individual pieces of an internal reinforcement ribbing structure of predetermined arrangement in a continuous foamable casting material;

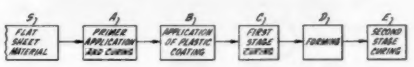
d. applying a second layer of material comprising a fiber-reinforced resinous laminate; and

e. applying to the fabricated reflector surface a continuous layer of a reflecting agent.

3,855,028
METHOD OF FABRICATING STRUCTURES

Donald J. Larson, 527 W. Algonquin Rd., Arlington Heights, Ill. 60005

Filed Nov. 8, 1972, Ser. No. 304,628
U.S. Cl. 156—79 **8 Claims**



1. A method of fabricating insulated structures such as duct work, pipe and housings and the like from sheet or strip material, comprising the steps of:

a. applying a thin film of expandable plastic to at least one side of a sheet or strip of material,

b. said plastic comprising a foamable vinyl chloride polymer which can be at least partially cured without noticeable expansion when heated to a temperature not exceeding 350°F for 60 seconds or less,

c. heating the strip or sheet of material in a first stage curing operation for approximately 60 seconds to at least partially cure the plastic and cause it to be bonded to the sheet or strip but insuffficient to cause noticeable expansion of the plastic,

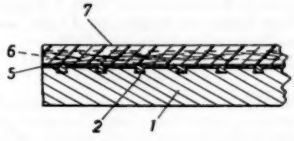
d. forming the sheet or strip of material into a desired structure, and

e. heating the structure in a second stage curing operation for a predetermined period of time sufficient to cause said plastic film to expand at least several times in thickness.

3,855,029
METHOD FOR RE-INFORCING CAST-METAL OBJECTS, PARTICULARLY THIN PLATES OF HARD AND BRITTLE CAST STEEL

Erik Arne Sabel, Box 128, S-940 20 Ojebyn, Sweden

Continuation of Ser. No. 829,559, June 2, 1969, abandoned. This application Mar. 14, 1973, Ser. No. 340,995
Claims priority, application Sweden, Mar. 12, 1969, 3384/69
Int. Cl. B32b 7/00
U.S. Cl. 156—92 **3 Claims**



1. A method of making re-inforced thin plates of brittle metal comprising the steps of: casting a thin plate of steel having a hardness in excess of 400 Brinnel and having recesses distributed on a major surface thereof for receiving anchors therein, bonding spaced-apart anchors in said recesses and disposed upstanding and projecting from said major surface of said plate, placing on said major surface of said plate a layer of net armouring with said anchors extending into said net armouring, anchoring said net armouring with said anchors, diffusing synthetic resin through said net armouring around said anchors and in contact with said major surface, and curing said synthetic resin to intimately bond said net armouring

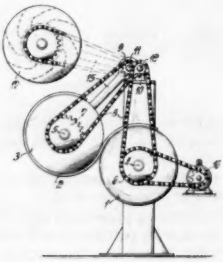
to said major surface of said plate and said anchors for reinforcing said steel plate.

3,855,030

METHOD AND APPARATUS FOR APPLYING A TREAD STRIP TO A CARCASS

Wilhelm Schelkmann, Witten, Germany, assignor to Vakuum Vulk Holdings Ltd., Nassau, Bahamas

Filed Apr. 12, 1972, Ser. No. 243,202
Int. Cl. B29h *17/37*
U.S. Cl. 156—130 15 Claims



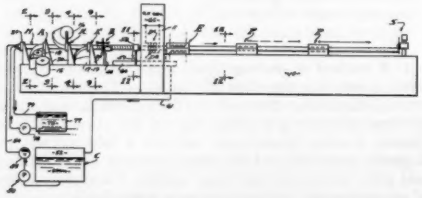
1. A method of applying a tread strip with a repeating pattern to the circumference of a carcass comprising the steps of cutting from an elongated tread strip a portion having a length approximately equal to the length of the outer circumference of the carcass in such a manner that the profile of the tread pattern at one end of the cut off portion matches the profile at the other end; placing the cut off tread strip portion around the peripheral surface of a drum which is rotatable about its axis with the tread pattern engaging the peripheral drum surface over the whole circumference thereof; bringing the surface of the cut off strip portion opposite to the pattern surface at one end of the cut off strip portion into engagement with the peripheral surface of a carcass rotatable about an axis parallel to the drum axis; and rotating the drum and the carcass with equal angular velocities and respectively in opposite directions so as to evenly distribute and adhere said strip portion onto the periphery of the carcass regardless whether the length of the cut off strip portion corresponds exactly to the length of the outer periphery of the carcass or not.

3,855,031

METHOD AND APPARATUS FOR LAMINATING, IMPREGNATING AND CURING CONTINUOUS TUBES

Arthur O. McNeely, Redondo Beach; Wiley T. Kennedy, Santa Ana, and Paul Huska, Los Angeles, all of Calif., assignors to Mackenhus Corporation, Santa Ana, Calif.

Filed Feb. 16, 1972, Ser. No. 226,811
Int. Cl. B31f *1/00*
U.S. Cl. 156—190 6 Claims



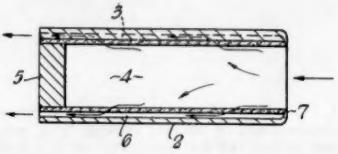
1. The method of laminating, impregnating and curing continuous unlimited length tubing composite of laminiform profile, and including; anchoring the one rear end of an elongated mandrel having a cross sectional configuration to establish the inner profile of the composite, dry forming at least one strip-shaped lamina over the mandrel and into encompassing conformity with said configuration thereof by wrapping the same longitudinally over the rear portion of the mandrel establishing a laminiform thereof while continuously advancing the same forwardly by traction applied thereto ahead of the front end of the mandrel, impregnating the previously dry laminiform with curable thermosetting liquid resin during its continuous advancement over the intermediate portion of the mandrel, and accelerating final cure of the liquid impregnated laminiform by applying heat during its continuous advancement over the front portion of the mandrel.

3,855,032

PRODUCTION OF TOBACCO-SMOKE FILTERS

John A. Luke, Southampton, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Mar. 8, 1972, Ser. No. 232,669
Claims priority, application Great Britain, Mar. 12, 1971, 6693/71
Int. Cl. B31f *1/00*
U.S. Cl. 156—201 14 Claims



1. A method of continuously producing tobacco smoke filter components comprising:

a. depositing lengths of smoke-impermeable plug material upon a strip of filter material at predetermined intervals so that the lengths of plug material are spaced a substantially greater distance apart than their individual lengths;
b. forming a tube of the strip about said plug lengths;
c. disposing an outer smoke-impermeable tubular casing around the tube;
d. providing means between said filter material and said tubular casing to retain at least portions of said casing and filter material in spaced relation to provide a longitudinal smoke flow between said filter material and plug assembly and said smoke-impermeable tubular casing;
e. forming a circumferential seal between said casing and said tube at desired spaced positions from said plugs to prevent the passage of smoke between the casing and tube at the point of said seal; and
f. cutting said tube into individual filter smoke components each having a circumferential seal at one end thereof.

3,855,033

METHOD OF MAKING EMBOSSABLE MONOLITHIC IDENTIFICATION CREDIT CARD

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, Northbrook, Ill.

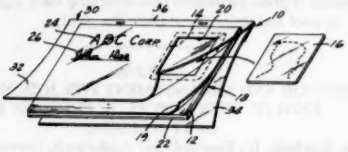
Filed June 19, 1972, Ser. No. 263,934
Int. Cl. B31f *1/08*
U.S. Cl. 156—220 8 Claims

1. A method for making an embossable identification credit card having thereon an overlaminated photograph and signature, said method comprising:

a. providing a metal plate having a portion cut out from it and inserting said photograph therein;
b. folding a data sheet having a heat-reactivatible adhesive therein around said metal plate, said data sheet having a cut-out portion corresponding to said cut-out portion of said metal plate and a signature thereon;

c. inserting said assembled metal plate, photograph and folded data sheet into a clear pouch having heat-reactivatible adhesive therein; and

d. applying heat and pressure to said assembled metal plate, photograph, folded data sheet and said clear pouch for a sufficient period of time to laminate said folded data



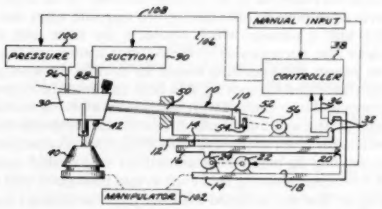
sheet to both sides of said metal plate and around the edges of said photograph, and said clear pouch to said data sheet over said photograph and signature and to itself around the edges of said sheet, whereby a monolithic identification credit card is produced which can be embossed with stable, raised indicia.

3,855,034

METHOD AND APPARATUS FOR BONDING IN MINIATURIZED ELECTRICAL CIRCUITS

Charles Frederick Miller, 2165 North Glassell St., Orange, Calif. 92665

Filed Dec. 10, 1973, Ser. No. 423,321
Int. Cl. B31f *5/00;* **B65c** *11/04;* **H01r** *43/00*
U.S. Cl. 156—297 **10 Claims**



1. The method of bonding one element to another element using a tool holder apparatus which includes a suction pick-up opening and an adhesive dispensing opening, said openings being separated by a distance and opening in like direction, the holder apparatus being rotatable to place both of said openings, one at a time, in a line extending in said direction and to move the opening so placed in the direction of said line, which method comprises the steps of:

rotating said apparatus to place the adhesive dispensing opening in said line and moving said apparatus to move said adhesive dispensing opening along said line;

causing a quantity of adhesive to be dispensed from said adhesive dispensing opening; and

while applying suction at said suction pick-up opening, rotating said apparatus to place said suction pick-up opening in said line and moving said apparatus such that said suction pick-up opening is moved in the direction of that line toward the point at which said quantity of adhesive was dispensed; and

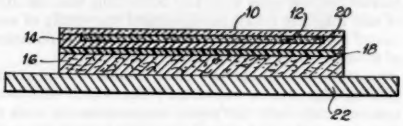
ending application of suction to said suction pick-up opening.

3,855,035

IMAGE INTENSIFIER PLATE AND METHOD AND COMPOSITIONS FOR MANUFACTURING SAME

Clayton W. Bates, Jr., San Francisco, and John C. Eidson, Palo Alto, both of Calif., assignors to Varian Associates, Palo Alto, Calif.

Filed June 22, 1972, Ser. No. 265,316
Int. Cl. C09j *5/00;* **B32b** *31/12*
U.S. Cl. 156—306 **11 Claims**



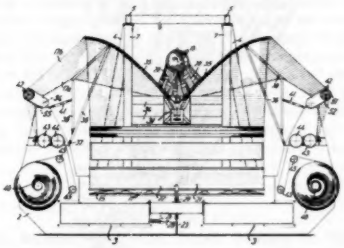
1. In the method of producing an image intensifier plate comprising the steps of coating a transparent, moisture impermeable substrate formed of glass or plastic having a thickness within the range of 2–8 mils with activated cesium iodide particles having an average particle size within the range of 2–10 microns to a pack density greater than 70 percent, heating the coated substrate to a temperature above 350°C but below the fusion temperature for the particles to burn out organic components from the coating and set the binder, and sealing the coating with a moisture impermeable layer on the side opposite the substrate in which the moisture impermeable layer is selected from the group consisting of a metal, glass and plastic.

3,855,036

MACHINE FOR PRODUCING NON-WOVEN NETTINGS

Erik Solbeck, No. 342 Vedhaek Strandvej, 2950 Vedbaek, Denmark

Filed Feb. 1, 1973, Ser. No. 328,589
Claims priority, application Denmark, Feb. 9, 1972, 578/72
Int. Cl. B65h *81/00*
U.S. Cl. 156—426 **9 Claims**



1. In a machine for producing a non-woven netting comprising crossing warp and transverse threads connected together at their points of crossover, said machine including

a stationary frame having support means of at least substantially circular cross section for supporting a plurality of parallel warp threads in the form of a cylindrical thread layer,

means for jointly advancing said warp threads in their longitudinal direction,

at least one rotary thread guide for laying a transverse thread in a helical configuration around said layer of warp threads to form a hose-like web,

drive means for rotating said thread guide,

means for longitudinally slitting said hose-like web into at least two individual nettings,

at least two rotatably supported rollers spaced from said support means and having rectilinear axes, and guide

means between said slitting means and each of said rollers for reshaping each netting into a flat shape, the improvement wherein said guide means comprises

a. a stationary guide member formed with a curvilinear guiding edge located adjacent the path of said hose-like web with its ends located downstream of the associated slitting means and extending from said ends symmetrically outwardly relative to a line connecting the slitting means and forwardly in the direction of advance of said hose-like web whereby the center point of said edge is located furthest away from said connecting line, the axes of said rotatable rollers being located rearwardly of said center point of the guiding edge, as seen in the direction of travel of said hose-like fabric, and

b. two stationary guide bars each located between said guiding edge and an associated roller, which bars issue symmetrically from two points intermediate the ends of the guiding edge and extend outwardly towards the ends of the roller.

3,855,037

MANUFACTURE OR CLOSING OF SACKS BY WELDING CUT LENGTHS OF TUBE OF THERMOPLASTICS

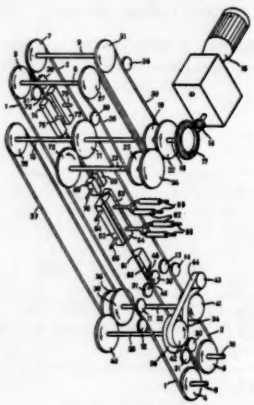
Karl-Heinz Imhagen, Limburgerhof; Werner Kasper, Frankenthal; Gernot Manhart, Limburgerhof, and Werner Weidner, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen/-Rhine, Germany

Filed July 30, 1970, Ser. No. 59,529

Claims priority, application Germany, Aug. 4, 1969, 1939571

Int. Cl. B32b *31/00*

U.S. Cl. 156—497 **10 Claims**



1. Apparatus for welding cut lengths of a thermoplastic film tube in the manufacture of sealed sacks which comprises:

motor-driven guide members facing one another to grip a flat length of the tube, which is cut open at one end transversely to the front and rear side edges thereof, in such a way that said front and rear side edges project from the guide members by an amount approximately equal to the intended breadth of the weld, said guide members being adapted to advance the resulting projecting two-layer strip formed by the exposed end-face edges through the welding apparatus;

a resistance member mounted laterally in the path of the projecting two-layer strip to contact the front side edge thereof as the strip is being advanced by said guide members and to fold open said front side edge of said strip;

knife means mounted next to the resistance member in the path of the advancing strip with its point of cutting engagement set at a position between said resistance member and said guide members to first cut the projecting two-layer strip at its folded open front side edge and subsequently at its rear side edge;

guide plate means following said knife means in the path of the advancing strip to fold apart the two-layer strip;

heating means following said guide plate means in the path of the advancing strip to heat the inner surfaces thereof after they are folded apart to a fusing temperature; and

means to press the heated two-layer strip back together and to cool and strip to complete the weld.

3,855,038

METHOD AND ARRANGEMENT FOR JOINING THE ENDS OF THERMOPLASTIC PROFILES BY HEAT-WELDING

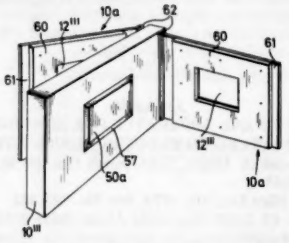
Otto Anschutz, Im Rosental, 547 Andernach, Germany

Filed Feb. 8, 1973, Ser. No. 330,862

Claims priority, application Germany, Mar. 10, 1972, 2211548

Int. Cl. B32b *31/20*

U.S. Cl. 156—499 **12 Claims**



1. An arrangement for joining the ends of thermoplastic workpieces by heat-welding, comprising a heated element having two opposite sides each provided with a recess whose contour corresponds to the exterior contour of the ends to be joined; a welding jig also having two opposite sides and provided with a passage which connects the same and whose contour also corresponds to the exterior contour of the ends to be joined; and operating means for holding the workpieces to be joined and for moving said ends first into the respective recesses and into contact with said heated element so that the thermoplastic material of said ends softens in response to such contact, then retracting the ends from said recesses so that said welding jig may be substituted for said heated element, and thereupon abutting said ends in said passage of said welding jig so that the softened material joins the abutted ends in response to its hardening while said ends are located in said passage of said welding jig.

3,855,039

APPARATUS FOR HEAT-SEALING SUPERIMPOSED LAYERS OF SHEET MATERIAL

Winfried Boettcher, Leipzig, Germany, assignor to VEB Polygraph Leipzig, Kombinat Fuer Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

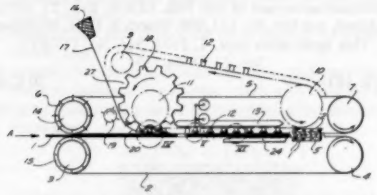
Division of Ser. No. 164,307, July 20, 1971, abandoned. This application Dec. 1, 1972, Ser. No. 311,259

Int. Cl. B32b *7/04*

U.S. Cl. 156—521 **6 Claims**

1. In an apparatus for connecting superimposed layers of sheet material, in combination, advancing means for continuously advancing a stack of superimposed sheet material layers at a predetermined speed and in a predetermined path; supply means for engaging a thread and for moving the same at least intermittently at said speed; cutting means for severing at least one predetermined length of said thread per stack from the remainder of said thread, said length having spaced end portions engaged by said supply means and sharing said move-

ment of the latter to a position along said path adjacent one major surface of said advancing stack; pressing means for pressing said length, when in said position, intermediate said end portions thereof against said major surface with a force sufficient to disengage said end portions from said supply means, said pressing means mounted mouned for movement at said speed in a different path having a path portion extending along said predetermined path in close proximity thereof so as to press said length against said major surface during said



movement of said pressing means in said path portion; stitching means spaced from said supply means and adjacent said path portion and operative for engaging said end portions of said length and for pushing the same through said stack beyond the opposite major surface thereof; and sealing means located proximal to said predetermined path in the region of said path portion at said opposite major surface and operative for deflecting said end portions into contact with said opposite major surface and for sealing the former to the latter during the advancement of said stack in said predetermined path.

3,855,040

ANAEROBIC COMPOSITIONS

Bernard M. Malofsky, West Hartford, Conn., assignor to Loctite Corporation, Newington, Conn.

Continuation-in-part of Ser. No. 268,233, July 3, 1972, abandoned. This application Apr. 2, 1973, Ser. No. 347,280

Int. Cl. C09j *5/04;* **C08f** *3/62;* **B32b** *7/10*

U.S. Cl. 156—310 **39 Claims**

1. A polymerizable anaerobic composition comprising a polymerizable acrylate ester monomer; hydroperoxide or a perester polymerization initiator capable of polymerizing said monomer in the substantial absence of oxygen; and an effective amount for rapid polymerization of the acrylate ester monomer of an activator comprising an organic compound containing a ferrocene moiety.

3,855,041

FRANKING MACHINE WITH A LETTER FEEDING AND A TAPE FEEDING DEVICE

Alfred Kunisch, Berlin, Germany, assignor to Francotyk GmbH, Berlin, Germany

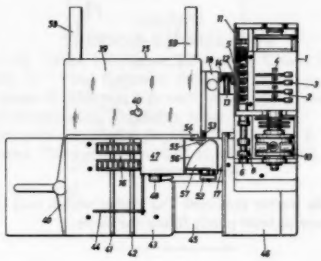
Filed Apr. 18, 1973, Ser. No. 352,129

Claims priority, application Germany, Apr. 20, 1972, 2219270

Int. Cl. B43m *5/00*

U.S. Cl. 156—442.2 **9 Claims**

1. Franking machine of the type alternately printing on letters or tapes having an entrance slot and having a common electromechanical drive for letter-feeding and tape-feeding devices which, depending on the manner of operation, can be moved into the respective operational position, wherein the letter-feeding device and tape-feeding device comprise an



independent structural unit, adapted to be shifted relative to the entrance slot of the franking machine.

3,855,042

PRESSURE POLISHED EXTRUDED POLYCARBONATE OR POLYSULFONE SHEET

Richard E. Moore, R.D. 1, Locust Grove Rd., West Chester, Pa. 19380

Division of Ser. No. 54,185, July 13, 1970, Pat. No. 3,681,483. This application Mar. 8, 1972, Ser. No. 232,725

Int. Cl. B29d *7/22*

U.S. Cl. 161—1 **1 Claim**

1. A pressure polished sheet of extruded, transparent unfilled polycarbonate whose opposed surfaces are substantially free of ripples, wiggles, extrusion die lines and stresses and whose luminous transmittance is greater than, its percentage haze less than and its distortion less than the as extruded sheet, said luminous transmittance being 0.900, said percentage haze being 0.7 and an index of refraction of 1.62, as measured with ⅛ inch extruded sheet, said sheet being made by first preheating the as extruded sheet between a pair of mirror polished plates at a pressure of zero to a maximum of 50 psi to the heat distortion temperature of the sheet to expel air entrapped between the sheet and the plates, then increasing the pressure to about 300 to 500 psi while allowing the temperature to rise to about 310°–330°F to transfer the mirror finish of the plates to the sheet surfaces while substantially eliminating the ripples, wiggles and extrusion die lines and stresses, and then cooling the sheet while reducing the pressure to fix the mirror finish in the sheet surfaces as the sheet contracts and solidifies.

3,855,043

BEADED ARTICLE

Minoru Kuroda, Hyogo-ken, Japan, assignor to Nishizawa Shoji Co. Ltd., Osaka, Japan and The Dimension Weld International Corporation, New York, N.Y., part interest to each

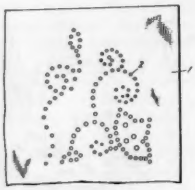
Continuation of Ser. No. 80,385, Oct. 13, 1970, abandoned, which is a division of Ser. No. 808,128, March 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 662,902, Aug. 24, 1967, abandoned. This application July 7, 1972, Ser. No. 269,563

Int. Cl. B29c *3/00;* **B32b** *3/00*

U.S. Cl. 161—5 **7 Claims**

1. A beaded article, comprising, in combination, a support; a plurality of spaced-apart discrete beads, each bead comprising a bottom layer of synthetic plastic sheet material superimposed upon said support and a top layer of light-transmitting synthetic plastic sheet material on said bottom layer and unitary therewith at least along a narrow circumferentially complete annular zone coinciding with the marginal zones of said layers, said layers being adhered to one another and to said support along said narrow annular zone by a heat-welded

seam, and said top layer having within the confines of said zone a hollow self-supporting bead-like prominence; and



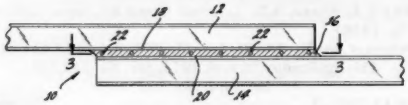
particulate matter confined and visible within said bead-like prominence at least partly filling the same.

3,855,044

CORROSION RESISTANT ADHESIVE BONDING SYSTEM

Frank J. Riel, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Aug. 6, 1973, Ser. No. 386,040
Int. Cl. B32b *15/02, 15/08*
U.S. Cl. 161—89 **3 Claims**



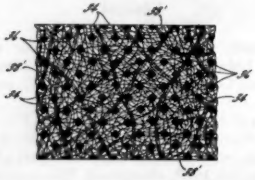
1. A corrosion resistant joint for joining at least two structural metal parts, comprising metal to adhesive interfaces, wherein said adhesive comprises an epoxy resin containing a metal reducing agent interspersed within the body of said adhesive said reducing agent comprising a metal higher on the electronegativity scale then the metals being bonded, said reducing agent being a sacrificial material whereby said material substantially corrodes prior to the metals along the interfaces thereof corroding.

3,855,045

SELF-SIZED PATTERNED BONDED CONTINUOUS FILAMENT WEB

Robert J. Brock, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 21, 1972, Ser. No. 219,751
Int. Cl. B32b *31/20, 3/00*
U.S. Cl. 161—146 **8 Claims**



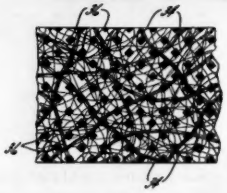
1. A nonwoven web having a basis weight of about 1 oz./yd.^{2} – 3 oz./yd.^{2} consisting essentially of substantially identically prepared continuous and randomly deposited, molecularly oriented filaments of a thermoplastic polymer having a denier of about 0.5–10, said web having a multiplicity of discrete compacted areas of autogenous filament bonds distributed in an intermittent pattern on the surfaces in a density of about 100–500 per square inch and occupying about 10–25 percent of web surface area with the web filaments disposed adjacent to the web surfaces in regions between compacted areas being secured together at cross-over points with autogenous bonds of lower intensity than within the compacted areas, said web having a cantilever stiffness length of at least about 1 ⅛ inches, basis weight normalized tensile strength of at least about 6, and exhibiting at least about a 30 percent reduction in cantilever stiffness length after a single wash cycle.

3,855,046

PATTERN BONDED CONTINUOUS FILAMENT WEB

Paul Bernard Hansen, Neenah, and Leon Benjamin Pennings, Little Chute, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. Nos. 15,034, Feb. 27, 1970, abandoned, and Ser. No. 121,880, March 8, 1971, abandoned.
This application Sept. 1, 1971, Ser. No. 177,077
Int. Cl. D04h *1/04*
U.S. Cl. 161—150 **20 Claims**



1. A soft, drapable nonwoven web consisting essentially of a plurality of substantially identically prepared continuous and randomly deposited, molecularly oriented filaments of a thermoplastic polymer, said web having a multiplicity of discrete, compacted areas of autogenous releasable filament bonds extending through a major portion of the thickness of the web, said compacted areas being distributed in an intermittent regular pattern providing unbonded filament spans therebetween which align in a direction of strain to enhance strain distribution throughout the web, said releasable filament boonds serving to hold the filaments which are on, and adjacent to, the web surfaces for stabilizing the web and for rendering the surfaces thereof abrasion resistant and said releasable bonds having an intensity approaching but less than the breaking strength of the filaments such that the bonded filaments pull free from one another before fracturing when the web is subjected to strain.

3,855,047

SHEET-LIKE NONWOVEN WEB AND FLEXIBLE ARTICLE OF POLYESTER AND AROMATIC POLYAMIDE STAPLE FIBERS

Gaylord L. Groff, North Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 152,591, June 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 53,120, July 8, 1970, abandoned. This application Jan. 5, 1973, Ser. No. 321,444
Int. Cl. D04h *1/04;* **B32b** *7/04*
U.S. Cl. 161—150 **5 Claims**

1. A sheet-like nonwoven web impregnated with an electrically insulative, moisture-insensitive thermoset resin, said sheet-like nonwoven web being formed from a fiber blend comprising between 15 and 60 weight % undrawn polyester staple fibers at least partially heat softenable at temperatures below 200° C. 0 up to 60 weight percent drawn polyester staple fiber, and, in intimate admixture with said undrawn polyester staple fibers, at least 10 but no more than about 75 weight % discontinuous aromatic polyamide staple fibers.

3,855,048
FOAM LAMINATES

Raymond Bagnall, Cheadle, England, assignor to Caligen Foam Limited, Lancashire, England

Filed Jan. 5, 1973, Ser. No. 321,172
Claims priority, application Great Britain, Jan. 19, 1972, 2463/72
Int. Cl. B32b *31/20, 31/26*
U.S. Cl. 161—159 **9 Claims**

1. A process of laminating cloth to opposite sides of polyurethane foam, comprising the steps of:
   a. providing a sheet of polyurethane foam,
   b. heating one side of the foam sheet to at least 400°C,
   c. pressing a cloth layer against said one side to laminate the cloth and foam,
   d. heating the other side of the foam sheet to no higher than 360°C and
   e. pressing another cloth layer against said other side of the foam to laminate the another cloth layer and the foam,

   thereby producing a laminate comprising the polyurethane foam sheet sandwiched between the two cloth layers.

3,855,049
COMPOSITE POLYMER PRODUCTS FOR THAT

Max Klein, New Shrewsbury, N.J., assignor to Normac, Inc., Matawan, N.J.

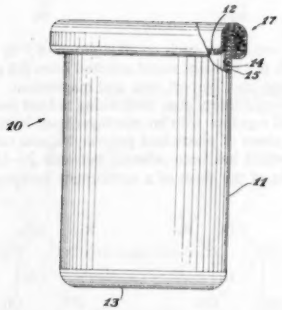
Filed Mar. 2, 1971, Ser. No. 120,346
Int. Cl. C08g *41/04;* **B32b** *5/20*
U.S. Cl. 161—160 **8 Claims**

1. A rigid, light weight structural composite polymer, overall stably adherent unitary solid block which comprises discrete, relatively fully expanded styrene-polymer bit-pieces adhesively enmeshed in a thermoset foam polyurethane matrix, wherein said styrene-polymer bit-pieces are by weight from about 3.38 to about 7.73 percent of the sum of said bit-pieces and the starting polyurethane-providing components.

3,855,050
METAL STRUCTURES WHICH ARE SELF-DESTRUCTIBLE BY CHEMICAL CORROSION

Percy F. George, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 16,725, March 5, 1970, Pat. No. 3,744,664. This application Feb. 22, 1973, Ser. No. 334,892The portion of the term of this patent subsequent to Oct. 9, 1990, has been disclaimed.
Int. Cl. B32b *15/04, 15/12;* **B65d** *7/22*
U.S. Cl. 161—165 **9 Claims**



1. A metal structural laminate comprising:
   a. at least two metal layers; and
   b. at least one layer of a metal-corroding composition positioned between the metal layers, said composition being capable, when contacted with moisture, of chemically corroding each of the metal layers.

3,855,051
THERMAL BARRIER TAPE

Anthony R. Lania, Lexington; Edward L. Chase, Brockton; Francis M. Chase, Cohasset; Leonard P. Graham, Canton, and James E. Murray, Norwood, all of Mass., assignors to Chase Corporation, Randolph, Mass.

Continuation-in-part of Ser. No. 77,248, Oct. 1, 1970, abandoned. This application Mar. 16, 1973, Ser. No. 341,934
Int. Cl. B32b *17/10*
U.S. Cl. 161—165 **6 Claims**

1. A flexible heat insulating tape suitable for use in making an electrical cable by placement between the primary conducting members thereof and a hot-melt thermoplastic sheathing, and consisting of (a) a polymer component, formed of a thermoplastic resin having a breakdown voltage of at least 7,000 and a heat-distortion temperature of at least 200° F. and which component is from 1 to 3 mils in thickness and (b) a glass paper ply on one side of, or sandwiched between two sheets forming said polymer component, and characterized by a thermal conductivity of about 0.3 BTU-inch per hr-ft^2-F°, and not over about 10% organic binder, said paper ply being from 3 to 20 mils in thickness and forming the major portion of the thickness of said tape.

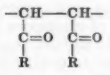
3,855,052
ADHESIVE TAPE COATED WITH A CONTROLLED RELEASE COATING COMPOSITION

Thomas S. Mestetsky, Easton, Pa., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 166,568, July 27, 1971, Pat. No. 3,770,687. This application Oct. 12, 1973, Ser. No. 405,764
Int. Cl. C08f *35/02;* **B44d** *1/02*
U.S. Cl. 161—167 **11 Claims**

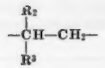
1. A base sheet material, one surface of which carries an outer adhesive layer, the other surface of said sheet material carrying an outer layer formed by depositing and curing on said other surface a controlled self-release coating composition comprising an organic solvent solution containing 0.5 to 50 weight percent of a resin mixture comprising, by weight:
   a. 5 to 95 percent of a solvent soluble polyorganosiloxane anti-stick release polymer, and
   b. 95 to 5 percent of an organic solvent soluble polymer having a relative viscosity of at least 0.1 and containing at least 15 mole percent of recurring units of the following formula:

(1)



wherein each R is OR′ or N(R″)$_2$, R′ being individually H, C$_{1-22}$ alkyl, aryl, alkaryl, amine, metal or ammonium cation, or the two R groups taken together form an oxa or imide group, R″ being hydrogen or a non-olefinic hydrocarbon moiety, with the remaining units being recurring units of the formula:

(11)



wherein R^2 is hydrogen or methyl and R^3 is COOR', OR', CN, aryl, aralkyl or halo, provided that at least one of the R and R^3 moieties in said units comprises a non olefinic C_{4-22} hydrocarbon radical, said polyorganosiloxane polymer being operative to impart self-releasing properties and a non-adherent surface.

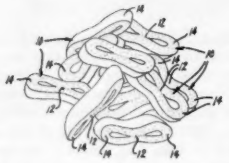
3,855,053
IMPROVED PACKING MATERIAL

Gunter G. Fuss, Daly City, Calif., assignor to Free-Flow Packaging Corporation, Redwood City, Calif.

Continuation-in-part of Ser. No. 221,974, Jan. 31, 1972,. This application Jan. 8, 1973, Ser. No. 321,657

Int. Cl. B32b *3/26, 5/18*

U.S. Cl. 161—168 **7 Claims**



1. A free flow interlocking packing material of low bulk density in which the packing material comprises a plurality of individual packing units formed of a foamed semi-rigid expanded plastic material, such plastic material possessing sufficient internal strength to be self-sustaining under normal handling but capable of permanent shock-absorbing deformation in response to a potentially destructive external force, each of the individual packing units comprising a transversely severed segment of longitudinally stretched hollow crimped flattened tube formed of said foamed expanded plastic material, said segments presenting a generally bow shaped configuration having a central portion and two end portions wherein the foam structure is longitudinally stretched as respects the transverse dimension of said segments, said end portions of the segments being in the form of oppositely extending relatively flat loops, said central portion being in the form of two self-adhered layers of said foamed expanded plastic material, such structure imparting to the individual units an enhanced resistance to permanent deformation in the presence of potentially damaging static and dynamic loading without loss of ability to permanently deform and collapse in the presence of a potentially destructive external force.

7. A free flow interlocking packing material of low bulk density in which the packing material comprises a plurality of individual packing units formed of a foamed semirigid expanded plastic material, such plastic material possessing sufficient internal strength to be self-sustaining under normal handling but capable of permanent shock-absorbing deformation in response to potentially destructive external force, each of the individual packing units comprising a transversely severed segment of a pair of contiguous longitudinally stretched hollow tubes of foamed expanded plastic material which have been externally adhered to one another along their length, said segments presenting a generally bow shaped configuration having a central adhered portion and two oppositely extending flat loop portions wherein the foam structure is longitudinally stretched as respects the transverse dimension of said segments, such structure imparting to the individual units an enhanced resistance to permanent deformation in the presence of potentially damaging static and dynamic loading without loss of ability to permanently deform and collapse in the presence of a potentially destructive external force.

3,855,054
SULFUR ADHESIVE FOR WOOD LAMINATE

Hymin Shapiro; Albert P. Giraitis, and Robert N. Sanders, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed July 5, 1972, Ser. No. 269,198

Int. Cl. B32b *21/04, 9/04*

U.S. Cl. 161—182 **4 Claims**

1. An article of manufacture in which at least a portion of an adherend surface is bonded to at least a portion of another adherend surface by means of a solidified sulfur adhesive, the bonded surfaces being of wood and the solidified sulfur containing up to about 25 percent by weight of a plasticizer selected from the group consisting of polyethylene tetrasulfide, polydiacetic tetrasulfide, di-mercaptobutane, diallyl tetrasulfide, mercaptoethylene and cyclohexanethiols.

3,855,055
LAMINATED SAFETY GLASS AND INTERLAYER THEREFOR

Isawo Kanno, Kyoto; Toshiyuki Takashima, and Yoshiyuki Bokuda, both of Shiga, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

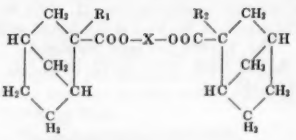
Division of Ser. No. 238,612, March 27, 1972, Pat. No. 3,838,091. This application Jan. 22, 1974, Ser. No. 435,579

Claims priority, application Japan, Mar. 30, 1971, 46-19491

Int. Cl. B32b *17/06, 17/10*

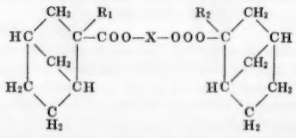
U.S. Cl. 161—199 **14 Claims**

1. A laminated safety glass comprising at least two sheets of glass bonded together with an interlayer consisting of a mixture of a plasticized polyvinyl acetal resin and 0.005 – 0.5 percent by weight, based on the weight of the polyvinyl acetal resin, of a norbornane compound of the formula



wherein R_1 and R_2 are each an alkyl group of 1 to 10 carbon atoms and X is a bivalent metal selected from the group consisting of cadmium, barium, zinc and magnesium.

8. A laminated safety glass comprising at least two sheets of glass bonded together with an interlayer, said interlayer consisting of a sheet of plasticized polyvinyl acetal resin, to the surface of which has been adhered between 20–150 mg per square meter of the sheet of a norbornane compound of the formula



wherein R_1 and R_2 are each an alkyl group of 1 to 10 carbon atoms and X is a bivalent metal selected from the group consisting of cadmium, barium, zinc and magnesium.

3,855,056
PROCESS FOR PRODUCING SYNTHETIC PULP-LIKE MATERIALS AND PRODUCING SYNTHETIC PAPERS THEREFROM

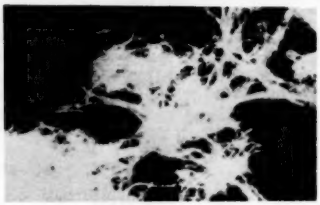
Yo Maeda; Masao Asaoka; Toshiro Okamura; Sigenori Nagahama; Yutaka Yamaguchi; Ikuo Hoshi; Kiyoshi Takaki; Yorimitu Masubuchi, all of Shimodate; Haruo Iigaya, Yuki, and Mineo Nakano, Hitachi, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Mar. 17, 1970, Ser. No. 20,219

Claims priority, application Japan, Mar. 19, 1969, 44-20358; Oct. 31, 1969, 44-86844; Mar. 19, 1969, 44-20359; Mar. 19, 1969, 44-20360; Oct. 31, 1969, 44-86842

Int. Cl. D21h *5/12*

U.S. Cl. 162—157 R **14 Claims**



1. A process for producing a pulp-like material, which comprises forming into a film a mixed resin comprising at least one orientable thermoplastic resin and at least one thermoplastic resin incompatible or poorly compatible with said orientable thermoplastic resin, highly stretching the resultant film at a temperature ranging from the softening point of the film to the melting point thereof, then cutting the resultant stretched film to a length of 0.2 to 5cm in the stretch direction to form flinders, and then fibrillating the flinders in an inactive liquid by applying a mechanical force to said flinders with a paper beater means.

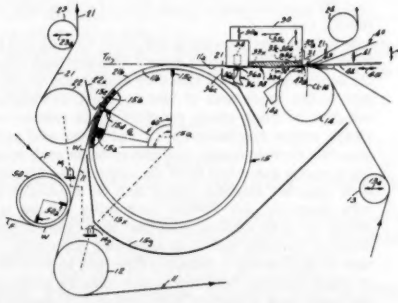
3,855,057
PAPER FORMATION UTILIZING A LARGE DIAMETER SUCTION ROLL

Lester M. Hill, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 680,173, Nov. 2, 1967, abandoned. This application Aug. 20, 1973, Ser. No. 65,689

Int. Cl. D21f *1/00, 2/00*

U.S. Cl. 162—301 **2 Claims**



1. An apparatus for forming fibrous webs comprising;

first and second continuous looped foraminous forming wires which are arranged to converge and provide an entrance nip for the reception of web-forming stock;

an elongated convexly contoured stationary unyielding surface positioned adjacent said entrance nip and in running contact with said second wire;

means for supporting said wires within their respective loops and moving said wires into said entrance nip;

said forming wires being arranged to travel over said stationary surface downstream of said entrance nip while having stock therebetween;

a relatively large diameter suction roll positioned downstream of said stationary surface and in running contact with said first wire, said suction roll having suction gland means substantially commensurate with its upper down-running quadrant;

said wires traveling around the top of said suction roll and along a down-running surface substantially commensurate with said upper down-running quadrant while having stock therebetween so as to dewater the same and form a web; and

a first guide roll positioned just before the off-running end of said upper down-running quadrant of said suction roll in running contact with said second wire for separating said second wire from the web traveling on said first wire.

3,855,058
METHOD AND DEVICE FOR DISCRIMINATING BETWEEN AND SORTING FUEL ELEMENTS OF NUCLEAR REACTORS

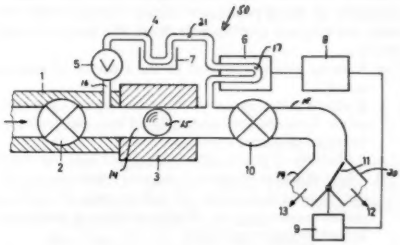
Ekkehard Groos, Julich, and Hans Ragoss, Stetternich, both of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Germany

Filed Mar. 19, 1973, Ser. No. 342,126

Claims priority, application Germany, Mar. 18, 1972, 2213238

Int. Cl. G21c *17/00, 19/00*

U.S. Cl. 176—19 R **21 Claims**



1. In a method of discriminating between and sorting fuel elements of nuclear reactors, wherein the fuel is in the form of coated fuel particles, such as spherical fuel elements, which are sluiced through the core of a high temperature nuclear reactor, and wherein the activity of the fuel elements is measured outside the core at a predetermined temperature whereupon, in dependence on the measured activity value, the fuel elementss are either returned to the core or are separated, the improvement which comprises:

a. maintaining each fuel element individually outside the core at a predetermined elevated temperature and for a predetermined dwell period in a measuring space;

b. contacting each fuel element within said measuring space during said dwell period with a predetermined amount of inert gas, whereby liberated fission gas products from said fuel element intermingle with said inert gas;

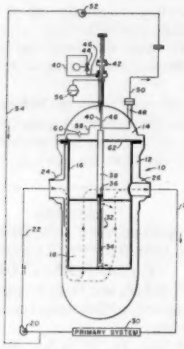
c. measuring the activity of the gas mixture thus obtained; and,

d. in dependence on the measured value thus obtained, either returning the fuel element to the core of the reactor or discharging the fuel element.

3,855,059
HYDRAULIC SYSTEM FOR NUCLEAR REACTORS WITH HYDRAULICALLY DRIVEN CONTROL RODS

Malcolm Duane Groves, 14 Musket Tr., Simsbury, Conn. 06070; Frank Bevilacqua, 155 Alcott Dr., Windsor, Conn. 06095, and Daniel Ernest Ferris, Star Route, North Canton, Conn. 06059

Filed May 11, 1972, Ser. No. 252,435
Int. Cl. G21c 7/16, 17/10
U.S. Cl. 176—36 R **17 Claims**



1. In a nuclear reactor including fissionable fuel elements, neutron absorber elements movable with respect to said fuel elements and fluid responsive actuators for positioning said absorber elements, said fuel elements, absorber elements and actuators all being positioned within reactor vessel having a main portion and a removable head, the improvement comprisng:

a. housing means attached to the exterior of said reactor vessel;

b. aperture means in said reactor vessel providing communication between the inside of said housing means and the inside of said reactor vessel;

c. a plurality of valves attached to said housing means;

d. a first plurality of conduit means commensurate in number with said plurality of valves each of said conduit means connecting one of said valves to at least one of said actuators and comprising:

i. a first conduit having a first and second end, the first end of said first conduit connected to at least one of said actuators, said first conduit extending through said aperture means into said housing means; and

ii. means in said housing means connecting the second end of said first conduit to one side of said one valve;

e. a common conduit means connected to the other side of said plurality of valves;

f. means for applying fluid lift forces; and

g. means connecting said common conduit means to said means for applying fluid lift forces.

3,855,060
BOTTOM ACTUATED REACTOR CONTROL ROD DEVICES

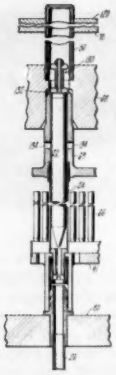
Joseph R. Dietrich, West Hartford, and Malcolm D. Groves, Simsbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed July 10, 1972, Ser. No. 270,470
Int. Cl. G21c 7/16
U.S. Cl. 176—36 R **2 Claims**

1. In a nuclear reactor, the reactor comprising a vessel for containing a circulating coolant under pressure and having a fuel assembly disposed therein, the fuel assembly including a plurality of fuel elements contained fissionable material, an improved control system comprising:

a plurality of substantially vertically oriented guide tubes extending through the reactor fuel assembly, each of said guide tubes comprising an elongated tubular member open at both ends;

extension means for each of said guide tubes, said guide tube extensions each comprising an elongated tubular member axially aligned with its associated guide tube and having an open lower end and a closed upper end, said guide tube extensions extending upwardly with respect to the reactor fuel assembly and terminating within the reactor vessel;



means coupling the open lower end of each of said guide tube extensions to the upper end of an associated guide tube whereby said guide tubes, coupling means and guide tube extensions cooperate to define hydraulic cylinders, said coupling means comprising end fittings which define internal passages coaxial with the aligned tubes and guide tube extensions, said end fitting internal passages at least in part having an annular portion of smaller diameter than said guide tube extensions whereby said smaller diameter portion of said end fittings define shoulder means within said hydraulic cylinders;

neutron absorber element means disposed for movement in said hydraulic cylinders relative to the reactor fuel assembly;

a source of coolant at a lift pressure in excess of the coolant pressure normally maintained within the reactor vessel, said lift pressure source being located exteriorally of the reactor vessel;

means for selectively coupling the lower ends of said guide tubes to said lift pressure source whereby said absorber element means may be raised by application of lift pressure to the lower ends of said hydraulic cylinders, said selective coupling means penetrating the reactor vessel; piston means mechanically connected to said neutron absorber element means, said piston means each comprising a piston extending from the upper end of its associated absorber element means into an associated guide tube extension, said pistons each being at least in part smaller in cross-sectional area than and complimentary in shape to the inner wall of its associated guide tube extension so as to define a restricted flow path to limit the rate at which fluid can flow downwardly past the piston out of the guide tube extension from above said absorber element means whereby pressure transients will not raise the absorber element means from their normal position assumed in said guide tubes when lift pressure is not applied thereto, said pistons further being at least in part larger in cross-sectional area than the smallest diameter portion of

said end fitting internal passages whereby said pistons may be supported on said shoulder means when the absorber element means are in their normal position inserted in said guide tubes; and

means including a flow orifice in the wall of each of said end fittings for providing communication between the interior of the pressure vessel and the interior of said hydraulic cylinders, said flow orifice permitting the flow of pressure vessel coolant into said hydraulic cylinders when lift pressure is not applied thereto from said lift pressure source and permitting flow of pressure vessel coolant out of said hydraulic cylinders from above said pistons when lift pressure is applied thereto.

3,855,061

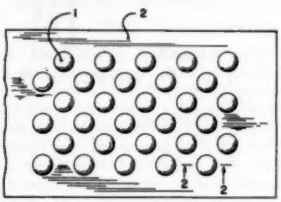
NUCLEAR REACTOR FUEL PLATE

Leonard Vincent Triggiani, Silver Spring; Moises Gali Sanchez, Severna Park, and George Elliott Ashby, Highland, all of Md., assignors to W. R. Grace & Co., Columbia, Md.

Continuation-in-part of Ser. No. 710,709, Feb. 28, 1968, Pat. No. 3,586,746. This application June 21, 1971, Ser. No. 155,014

Int. Cl. G21c *3/30*

U.S. Cl. 176—75 **5 Claims**



1. A nuclear reactor fuel element comprising:

a. at least one filler plate with a series of cells, said cells having a diameter of 10 – 3,000 microns and arranged in an ordered array;

b. at least one microsphere of fissile material located in said cells; the ratio of said cell volume to said microsphere volume being at least 1.5;

c. cladding plates secured to said filler plates and cooperating therewith to completely enclose said fissile material in said fuel element.

3,855,062

PROCESS FOR PREPARATION OF DERIVATIVES OF L-YROSINE

Ernst-Otto Renth; Kurt Schromm, and Anton Mentrup, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

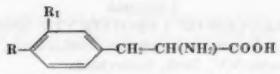
Filed July 19, 1972, Ser. No. 273,202

Claims priority, application Germany, July 22, 1971, 2136675; Jan. 3, 1972, 2200041; Apr. 1, 1972, 2216097

Int. Cl. C12d *13/06*

U.S. Cl. 195—2 **3 Claims**

1. The process for the preparation of a derivative of L-tyrosine of the formula

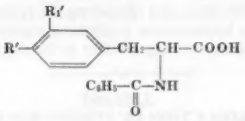
(L) 

wherein R

is hydrogen, hydroxyl or lower alkoxy, and

R_1 is hydroxyl or lower alkoxy,

provided, however, that at least one of R and R_1 is hydroxyl, which consists essentially of treating a derivative of DL-N-benzoyl-tyrosine of the formula

(DL) 

wherein

R′ is hydrogen, hydroxyl or lower alkoxy, and

R_1′ is hydroxyl or lower alkoxy,

with aniline or a ring-substituted aniline in a buffered aqueous solution having a pH of 5.6 to 6.2 and in the presence of a protease which is effective within this pH range to precipitate a correspondingly substituted L-N-benzoyl-m- or p-tyrosyl-anilide, separating said L-tyrosyl-anilide and hydrolyzing it with a mineral acid of suitable strength.

3,855,063

PROCESS FOR PRODUCING A MICROBIAL PROTEINOUS SUBSTANCE

Taro Nagasawa, Tokyo; Joji Ono, Chiba; Tutomu Kudo, Kawasaki, and Yoshitugu Harada, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd.

Filed May 12, 1971, Ser. No. 142,530

Claims priority, application Japan, July 3, 1970, 45-57783; Nov. 20, 1970, 45-102408

Int. Cl. C12b *1/00*

U.S. Cl. 195—28 R **17 Claims**

1. A process for producing a microbial proteinous substance, comprising the steps of:

1. mutating a hydrocarbon-assimilating yeast of genus Candida to mutants by chemical mutagenic agents or physical mutagenic means,

2. inoculating a suspension containing said mutants on a solid culture medium and incubating to form colonies,

3. selecting mutant strains totally deprived of cell wall integrity and lacking mannan from cells of said colonies by selecting colonies the surface of which is rough;

selecting cells of circular form from said colonies by an optical microscopic inspection;

staining said cells by Gram stain;

in which mannan contant is lower than 70% that in the parent strains incubated under the same conditions from said colonies,

4. proliferating said mutant strains in a culture medium, and

5. harvesting the proliferated cell mass for protein ingredients in food, feed or medicament.

3,855,064

PREPARATION OF A PROTEOLYTIC ENZYME

Albert Joseph Vroemen, Schipluiden, Netherlands, assignor to Gist-Brocades N.V., Delft, Netherlands

Filed Oct. 3, 1972, Ser. No. 294,602

Claims priority, application Great Britain, Oct. 6, 1971, 46508/71

Int. Cl. C12d *13/10*

U.S. Cl. 195—65 12 Claims

1. In a process for the preparation of a proteolytic enzyme of aerobically cultivating a *Bacillus alcalophilus* strain in a culture medium containing assimilable carbon and nitrogen sources and conventional compounds used in trace of small amounts in microorganism fermentation media, while maintaining the pH of the medium between about 7 and about 11 during the cultivation, and recovering the proteolytic enzyme produced, the improvement comprising maintaining a SO_4^{--} content of less than 15 mg per liter in the culture medium.

3,855,065

PRODUCTION OF STREPTOKINASE

Louis I. Feldman, Schiller Park, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.

Filed Oct. 30, 1972, Ser. No. 302,315

Int. Cl. C12d *13/10*

U.S. Cl. 195—65 6 Claims

1. In the fermentative production of streptokinase by the growth of hemolytic streptococci, the improvement which comprises growing the bacteria in a fermentation medium comprising from about 3% to about 12% corn steep liquor and from about 3% to about 12% glucose.

3,855,066

PROCESS FOR THE PRODUCTION OF AN AMYLASE INHIBITOR

Werner Frommer; Walter Puls, and Delf Schmidt, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 28, 1973, Ser. No. 336,687

Claims priority, application Germany, Mar. 1, 1972, 2209833

Int. Cl. C12d *13/02*

U.S. Cl. 195—80 R 6 Claims

1. A process for the production of an amylase inhibitor which comprises culturing the microorganism Actinoplanaceae CBS Strain 614.71 in a nutrient medium and recovering the amylase inhibitor from the resultant culture.

3,855,067

GLYCOSIDE METABOLITES OF OOSPORA VIRESCENS WALLR FUNGUS

Nera Cagnoli Bellavita, Via XX Settembre 2, Perugia, Italy

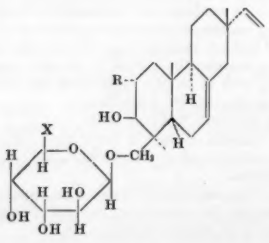
Division of Ser. No. 105,477, Jan. 11, 1971,. This application Aug. 23, 1973, Ser. No. 390,730

Int. Cl. C12b *1/00*

U.S. Cl. 195—81 6 Claims

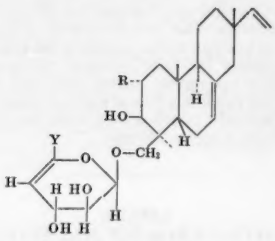
1. A method for producing a solution in ethanol of a mixture of the following compounds:

a.



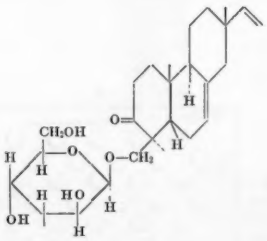
wherein R can be hydrogen or hydroxyl and X can be a carboxyl group or a — CH_2OH group

b.



wherein R has the meaning given above and Y is —CHO or —CH_2OH with the proviso that when Y is —CH_2OH, R is hydrogen and

c.



which comprises cultivating a glycoside-producing strain of *Oospora virescens* (Link) Wallr in aqueous glucose-organic decoction media at a temperature from 10° to 25°C. for a period of at least 10 days in stationary culture, said organic decoction selected from the group consisting of malt, glucose-yeast, glucose-carrot, glucose-wheat kernels, glucose-corn kernels, glucose-kidney bean seeds, glucose-pea seeds and glucose-lentil seeds and having a basic pH, lyophilizing and extracting with ethanol, cooling the ethanol solution to form a precipitate, filtering the solution, separating the compounds in the filtrate from each other on a chromatography column, acidifying the precipitate reserved from the filtering step and separating the remaining compounds on a chromatograph column.

3,855,068

APPARATUS FOR INTER-BED MIXING OF A FLUID QUENCH MEDIUM AND A VAPOR-LIQUID MIXTURE

Norman P. Lieberman, Park Forest, Ill., assignor to Standard Oil Company, Chicago, Ill.

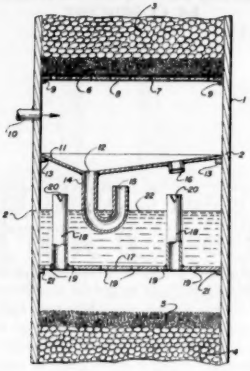
Filed Oct. 2, 1972, Ser. No. 294,478

Int. Cl. C10g *11/10*; B01j *9/04*

U.S. Cl. 196—155 11 Claims

1. Apparatus for inter-bed mixing of a fluid quench medium and a vapor-liquid mixture in a vessel containing at leaast two adjacent beds of solid contact material and having an inlet for said fluid quench medium between said beds of solid contact material, said apparatus being designed for use in said vessel at a location in said vessel such that said apparatus is between said beds of solid contact material and below said inlet, which

apparatus comprises: a horizontal vapor-liquid collection plate having an aperture, said collection plate contacting and being sealed to the vertical walls of said vessel; a U-Shaped pipe, a first end of said U-shaped pipe being appended to the bottom side of said collection plate at said aperture and the opening at the second end of said U-shaped pipe being below said bottom side of said collection plate and being positioned such that a fluid stream passing through said U-shaped pipe and emanating from said opening at said second end of said U-shaped pipe is directed toward and against a means for



breaking up said fluid stream, said means comprising the bottom side of said collection plate; and a horizontal chimney tray having open vertical tubular chimneys extending above the normal liquid level on the tray and holes at the bottom of the tray for distribution of liquid there through, said chimney tray being suspended from and supported by the vertical walls of said vessel and being located below said collection plate at a distance that is sufficient to permit on said chimney tray a liquid level that will provide substantially uniform distribution rates of liquid through said holes at variable liquid rates to said chimney

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3,855,069

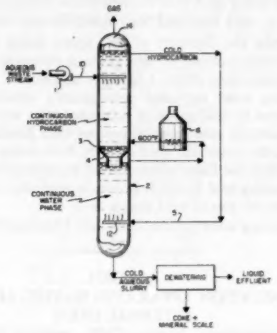
FORMATION REDUCTION IN PRESSURE COKING EQUIPMENT

Howard V. Hess, Glenham; William F. Franz, Gardiner, and Edward L. Cole, Fishkill, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 15, 1973, Ser. No. 323,554
Int. Cl. C10b *43/14*
U.S. Cl. 201—2.5 **7 Claims**

1. In a process for preventing the formation of scale on the walls of a pressure coking tower used for coking cokable aqueous waste materials in the liquid phase, the steps of:

passing relatively cool aqueous waste into direct counter-current contact with a relatively hot liquid hydrocarbon in the upper part of said coking tower whereby said hydrocarbon portion is cooled and said aqueous waste is heated at a temperature of 400° to 750°F under a pressure of 300 to 3500 psig to coke cokable materials in said waste and to precipitate scale to form a dispersed aqueous slurry, flowing the aqueous slurry downwardly into the lower part of said tower, withdrawing at least a part of said cooled hydrocarbon from the upper part of said tower and passing the same in direct counter-current contact with said downwardly flowing aqueous slurry in said lower part of said tower thereby cooling said slurry, withdrawing said slurry including said scale from the lower part of said tower, and withdrawing cooled hydrocarbon liquid which has contacted said slurry from the lower part of said tower, the passage of the liquid hydrocarbon in said upper and lower parts of said tower being



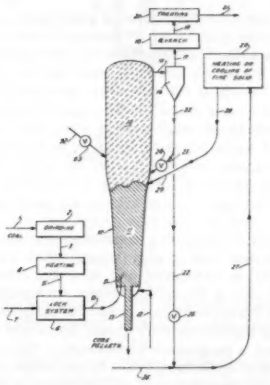
effective to wet the walls of said tower and prevent scale from adhering thereto.

3,855,070

HYDROPYROLYSIS OF HYDROCARBONACEOUS FUEL AT SHORT REACTION TIMES

Arthur M. Squires, 245 W. 104th St., New York, N.Y. 10025

Continuation of Ser. No. 167,686, July 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 812,786, April 2, 1969, Pat. No. 3,597,327. This application Oct. 26, 1973, Ser. No. 410,070
Int. Cl. C10b *49/22*
U.S. Cl. 201—23 **7 Claims**



1. A process for hydropyrolyzing a solid or liquid hydrocarbonaceous fuel at short reaction times, comprising:

providing a fluidized bed at a temperature between about 1100° and 1800° F and at a pressure greater than about 20 atmospheres, said fluidized bed comprising coke pellets larger than about one sixty-fourth inch and displaying at least a substantially five-fold range in diameter;

supplying fluidizing gas to said bed at a superficial velocity greater than about 5 feet per second, said gas containing hydrogen;

charging a solid or liquid hydrocarbonaceous fuel to said fluidized bed, the solid product of the hydropyrolysis of said fuel within said bed accreting upon said coke pellets;

providing a space situated above said fluidized bed to receive gaseous products of said hydropyrolysis including unreacted hydrogen, the dimension of said bed and said space being such that the residence of said gaseous products in said bed and said space is less than about 10 seconds, the diameter of said space being such that the superficial velocity of said gaseous products in said space is greater than about 4 feet per second;

supplying solid particles substantially smaller than 100 microns to said space at a temperature and rate of flow to maintain said temperature of said fluidized bed substantially constant, said rate of flow being sufficient to establish the fast-fluidized state in said space;

withdrawing said gaseous products and said solid particles froom the top of said space; and,

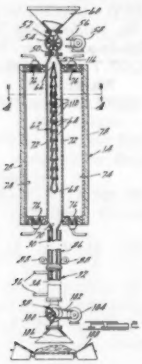
withdrawing coke pellets from said fluidized bed.

3,855,071

CARBONIZATION APPARATUS HAVING LOUVERS ON INTERNAL DUCT

Edward Koppelman, Encino, Calif., assignor to Continental Energy Corporation

Filed Dec. 8, 1971, Ser. No. 205,783
Int. Cl. C01k *3/00*
U.S. Cl. 202—121 **4 Claims**



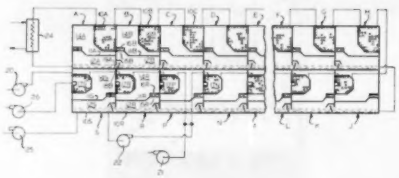
1. A reactor comprising a substantially upright reaction chamber formed with an inlet through which a carbonaceous feed material is introduced and an outlet through which a carbonized char is discharged, means for heating said chamber around the exterior thereof and for progressively heating the material therein inwardly toward the center of said chamber to effect a progressive carbonization thereof during the course of its travel from said inlet to said outlet, venting means comprising a foraminous duct comprised of a plurality of louvers angularly disposed in a downwardly and outwardly extending direction thereby defining a plurality of slots communicating between said chamber and the interior of said duct, said duct extending substantially centrally of said reaction chamber and for a major portion of the length thereof and said slots disposed at locations along the path of travel of the material for withdrawing the vapors and gaseous products in a direction substantially transversely of the direction of travel of the material as the vapors and gaseous products are formed during the carbonization of the material in the chamber, purging means disposed adjacent to said inlet for introducing a nonoxidizing gas into the interior of said reaction chamber for facilitating the purging of any entrapped air in said feed material and for sweeping said vapors and gaseous products out through said venting means, feed control means for controlling the quantity of feed material entering said inlet, outlet control means for controlling the quantity of carbonized char discharging from said outlet, and cooling means for cooling the carbonized char prior to its discharge from said reactor.

3,855,072

MULTI-STAGE FLASH EVAPORATOR

Philip J. P. Liu, Waukesha, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed July 28, 1972, Ser. No. 276,034
Int. Cl. B01d *3/02*
U.S. Cl. 202—173 **16 Claims**



1. A flash evaporator having means defining an enclosure, first means dividing said enclosure into an evaporating space adjacent a lower end thereof and a condensing space adjacent an upper end thereof, said first means having a passageway therein interconnecting said spaces,

spaced apart entrance and exit openings formed in said enclosure defining means and each opening into said evaporating space for respectively receiving and discharging feed liquid with respect thereto,

said evaporator being constructed and arranged to vaporize at least a portion of the feed liquid in said evaporating space and for passage of the resulting vapor upwardly through said passageway into said condensing space,

a vent port formed in said enclosure defining means and opening into said condensing space,

heat exchange tube bundle means disposed in said condensing space and between said passageway and said vent port, said heat exchange tube bundle means comprising a plurality of generally parallel unbaffled heat exchange tubes arranged generally horizontally and transversely to the flow of vapor through said condensing space and toward said vent port,

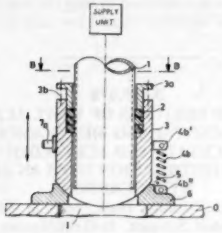
a first substantially vertical plurality of said heat exchange tubes defining a first marginal side of said heat exchange tube bundle and being disposed contiguously adjacent said enclosure defining means, a substantially vertical wall of said vent port opening into said first marginal side, a second plurality of said heat exchange tubes defining a second marginal side of said heat exchange tube bundle displaced from said vent port and being exposed to the vapors emanating from said evaporating space and passing into said condensing space through said passageway and a third marginal side of said heat exchange bundle spaced below and generally parallel to the upper wall of said enclosure to define therewith a third space,

means within said third space for preventing the flow of vapor to said vent port, said second plurality of tubes being substantially equidistant from said vent port.

3,855,073
EMISSION PREVENTION IN COKING OVENS

Werner Kucharzyk, Essen, Germany, assignor to Bergwerksverband GmbH, Essen, Germany

Filed June 11, 1973, Ser. No. 368,626
Claims priority, application Germany, June 10, 1972, 7221796
Int. Cl. C10b *31/04*
U.S. Cl. 202—262 **4 Claims**



1. In an oven, particularly a coking oven, a combination comprising wall means having an inlet through which material is to be admitted into said oven; supply means for supplying material to be so admitted; a filler pipe having a lower end portion and extending downwardly from said supply means toward said inlet in substantial registry therewith when said supply means is located above said inlet; and a terminal section on said lower end portion for tightly connecting the interior of said filler pipe with said inlet, said terminal section comprising a tubular member coaxial with said lower end portion, projecting from and being surrounded by the same and having a part-spherical free lower end, sealing means between and in sealing engagement with said terminal section and said lower end portion; an annular member located downwardly adjacent the lower end and having a surface in mating engagement with said part-spherical free lower end so that said annular member is tiltable relative to said tubular member said lower end portion and said annular member being provided with respective angularly spaced connecting lugs; and spring means connecting said annular member with said tubular member, comprising contraction springs extending axially of said filler pipe and each having opposite end portions which are respectively connected to one of said lugs on said pipe and one of said lugs on said annular member.

3,855,074
PLURAL TEMPERATURE CONTROLS OF DISTILLATION

Henry A. Mosler, and Richard Weber, both of Morristown, N.J., assignors to Esso Research & Engineering Company, Linden, N.J.

Filed Sept. 10, 1973, Ser. No. 395,929
Int. Cl. B01d *3/42*
U.S. Cl. 203—2 **20 Claims**

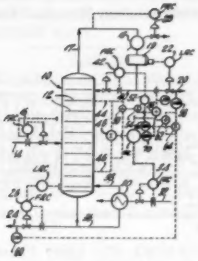
1. A method of controlling a one-feed, two-product multicomponent distillation column to maintain the desired split between light and heavy key components and the overhead and bottoms product purities, said column having product withdrawals above and below the feed tray and including reboiler heat supply and overhead condenser heat removal facilities comprising the steps of:

a. sensing the temperature on at least one tray above the feed tray between 20–40 percent of the distance between said top tray and the feed tray;

b. sensing the temperature on at least one tray below the feed tray between 20–40 percent of the distance between said bottom tray and the feed tray;

c. adding said sensed temperatures of (a) and (b) and thereby obtaining an index of the split between light and heavy components;

d. controlling a first operating variable of the column according to the summed temperatures of (c);



e. subtracting said sensed temperature of (a) from said sensed temperature of (b) and adding thereto a correction factor proportional to the ratio of overhead product rate to feed rate and thereby obtaining an index of the product purities;

f. controlling a second operating variable of the column according to the index of (e).

3,855,075
METHOD OF PURIFICATION OF ACRYLAMIDE BY DISTILLATION WITH A POLYMER INHIBITOR

Guenter Willi Nachtigall, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 3, 1972, Ser. No. 240,813
Int. Cl. B01d *3/34;* **C07c** *103/18*
U.S. Cl. 203—8 **5 Claims**

1. A process of purifying a crude acrylamide mixture which consists of at least 90 percent by wt. of acrylamide with the remainder of impurities not volatile at the boiling point of the crude mixture, said process consisting essentially of melting and boiling said mixture, with about 0.1 to about 0.5 percent by wt. of a polymerization inhibitor which is not volatile at the boiling point of the crude mixture in the liquid phase of said mixture, at distillation temperature in the range from about 88°C. to about 120°C. at pressure reduced sufficiently to boil the liquid crude mixture at such temperature and with a polymerization inhibiting gas present as carrier gas and polymerization inhibitor in the vapor phase, and condensing purified acrylamide from the vapor phase.

3,855,076
PROCESS AND DEVICE FOR PURIFICATION OF EFFLUENTS CONTAINING PHENOLS AND AMMONIUM SALTS

Paul Marecaux, Ville d'Avray, France, assignor to Societe Pour L'Equipment Des Industries Chimiques Speichim, Paris, France

Filed June 6, 1973, Ser. No. 367,511
Claims priority, application France, June 12, 1972, 72.21047
Int. Cl. B01d *3/00, 1/00, 1/14, 1/26*
U.S. Cl. 203—11 **5 Claims**

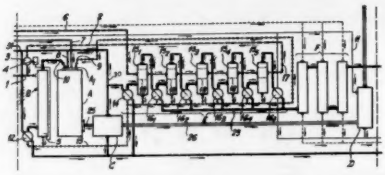
1. A method for continuously destroying polluting components of waste water, namely effluents from coke ovens, containing among other impurities phenolic materials, ammonia and ammonium salts of various acids, including strong acids, which comprises:

continuously adding an aqueous solution of caustic alkali to the waste water to substantially neutralize the same and to convert ammonium salts of strong acids in the waste water into ammonia and neutral salts;

stripping the neutralized waste water to separate volatile constituents in the gaseous state;

continuously stage distilling the stripped waste water and scrubbing the vapor from each stage with an aqueous solution containing caustic alkali;

continuously supplying an aqueous solution of caustic alkali to the first stage of the distillation process and circulating said caustic alkali solution from said first stage through



each stage to the last one to provide the scrubbing solution and then feeding the caustic alkali solution from the last stage to entering waste water for neutralizing the same as called for in the first step;

condensing and discharging said scrubbed vapor from the distilling stages; and,

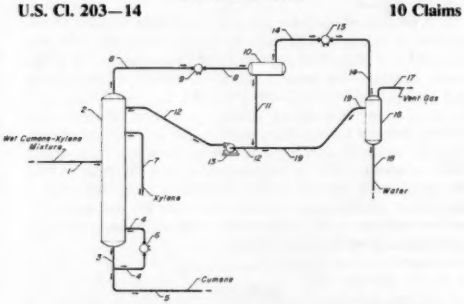
continuously and simultaneously burning said volatile constituents released in the neutralization step and the concentrate resulting from said distillation step.

3,855,077

DISTILLATION DRYING PROCESS

Herbert J. Bieser, Des Plaines, and Kenneth D. Uitti, Bensenville, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 30, 1972, Ser. No. 310,730
Int. Cl. C07c 7/04
U.S. Cl. 203—14 **10 Claims**



1. A process for the removal of a low dew point substance from a fractionation zone processing a feed stream comprised of a mixture of two high dew point materials in which the low dew point substance is immiscible at high concentrations, which process comprises the steps of:

a. passing the mixture of the high dew point materials and the low dew point substance into a fractionation zone;

b. withdrawing from said fractionation zone at the appropriate locations two desired liquid fractions of the high dew point materials;

c. withdrawing from said fractionation zone a first vapor phase comprising the lightest of said high dew point materials and the low dew point substance;

d. cooling this first vapor phase in a first condensation stage to a temperature which causes the formation of a liquid phase of the high dew point material and prevents formation of a liquid phase of the low dew point substance, and thereby also forming a second vapor phase which is rich in the low dew point substance;

e. separating said second vapor phase from the high dew point liquid formed in step (d);

f. returning high dew point liquid formed in step (d) to said fractionation zone as a reflux stream;

g. condensing essentially all of the high and low dew point material contained in said second vapor phase in a second condensation stage; and,

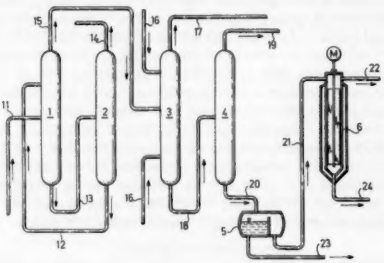
h. collecting the liquid formed in step (g) in a second receiving vessel to allow its separation into a liquid phase of the low dew point substance, and a liquid phase of the high dew point material equal to that fraction of the high dew point liquid not condensed in step (d) less the high dew point material dissolved in said low dew point liquid.

3,855,078

SEPARATION OF MIXTURES OF VINYL ACETATE AND METHANOL CONTAINING MINOR AMOUNTS OF METHYL ACETATE AND ACETALDEHYDE BY EXTRACTION DISTILLATION WITH AN AROMATIC HYDROCARBON

Gerhard Friedrich; Gunter Heck, both of Diedenbergen/-Taunus, and Adolf Schmidt, Hofheim/Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft Vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Oct. 23, 1973, Ser. No. 408,645
Claims priority, application Germany, Oct. 25, 1972, 2252276; Aug. 21, 1973, 2342144
Int. Cl. B01d 3/40; C07c 67/06
U.S. Cl. 203—37 **6 Claims**



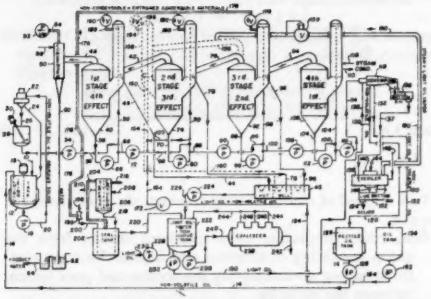
1. A process for separating by extractive distillation a mixture which is largely composed of vinyl acetate and methanol and contains minor amounts of methyl acetate and acetaldehyde as impurities and which may contain a small amount of water, which process comprises fractionally distilling said mixture in a first stage in the presence of an extracting agent to produce an overhead product largely composed of methanol, methyl acetate, acetaldehyde, small amounts of extracting agent and vinyl acetate and a small amount of water if present in the mixture, and a bottom product largely composed of extracting agent and vinyl acetate, said extracting agent being an aromatic hydrocarbon having an atmospheric pressure boiling point above 100°C., and fractionally distilling the bottom product of said first stage distillation in a second stage to produce vinyl acetate as an overhead product and the extracting agent as a bottom product.

3,855,079

PROCESS AND APPARATUS FOR RECOVERING RESIDUAL OIL FROM SOLIDS DEHYDRATED IN AN OIL MEDIUM AND GROSSLY DEOILED

Charles Greenfield, Murray Hill; Robert E. Casparian, Boonton, and Anthony J. Bonanno, Parsippany, all of N.J., assignors to Hanover Research Corporation, Hanover, N.J.

Filed Dec. 26, 1972, Ser. No. 318,424
Int. Cl. B01d 21/00, 1/22, 1/26, 1/00; F26b 7/00
U.S. Cl. 203—47 7 Claims



1. An apparatus for recovering clean water from water-insoluble aqueous solids, said apparatus comprising (1) a tank adapted to receive a stream of said aqueous solids and provided with a stirring or mixing mechanism, (2) a fluidizing oil reservoir, (3) a conduit for transmitting fluidizing oil from said oil reservoir to said tank wherein fluidizing oil and aqueous solids may be mixed, (4) a multi-stage evaporator comprising at least first and second stages, (5) a conduit extending from said tank to the second stage of said evaporator wherethrough may flow a stream of aqueous solids admixed with fluidizing oil from said tank into the evaporating region of said evaporator, (6) a vapor duct extending from the vapor chamber of said second evaporator stage to the evaporating region of the first evaporator stage through which may flow water vapor formed as a result of heat evaporation to thereby act as a source of evaporative heat in said first evaporator stage, (7) a first liquid-solid separating means, (8) a condudit extending from the final stage of said evaporator to said first liquid-solid separating means wherethrough may flow a stream of a substantially anhydrous slurry of water-insoluble solids in fluidizing oil, (9) a first repulping tank provided with a mixing or stirring device, (10) a conduit extending from said first liquid-solid separating means to said first repulping tank through which may flow solids containing residual fluidizing oil, (11) a source of a relatively light oil, (12) a conduit extending from said source of light oil to said first repulping tank wherethrough may flow light oil to be mixed with fluidizing oil-laden solids in said first repulping tank, (13) a second liquid-solid separating means, (14) a conduit extending from said first repulping tank to said second liquid-solid separating means wherethrough may flow a slurry of water-insoluble solids in light oil containing extracted residual fluidizing oil, (15) a second repulping tank provided with a mixing or stirring device, (16) a conduit extending from said second light-solid separating means to said second repulping tank through which may flow solids containing residual light oil, (17) a water reservoir, (18) a conduit extending from said water reservoir to said second repulping tank wherethrough may flow water to be admixed with light oil-laden solids in said second repulping tank, (19) a conduit extending from said second repulping tank to the first stage of the multi-stage evaporator wherethrough may flow a slurry of light oil-laden water-insoluble solids in water from said second repulping tank into the evaporating region of said first stage of the evaporator, (20) a condenser, (21) a conduit extending from said first stage of the evaporator to said condenser through which may flow water vapor and light oil vapor formed as a result of heating said slurry of light oil-laden solids in water, (22) a scalping tank, (23) means for withdrawing mixed water vapor condensate and light oil condensate from said condenser to said scalping tank wherein said mixed condensate is separated into a clean water product and light oil, (24) a settling tank, and (25) a conduit extending from said first evaportor stage to said settling tank wherethrough may flow a slurry of light oil-free water-insoluble solids in water from said first evaporator stage to said settling tank wherein said slurry is separated into wet solids and supernatant water.

3,855,080

RECOVERY OF CAPROLACTAM FROM OLIGOMERS BY HEATING AND FILM DISTILLATION

Lothar Becker, Ludwigshafen; Kurt Kuhr, Neustadt; Guenther Rapp, Ludwigshafen, and Otto Waschka, Mannheim, all of Germany, assignors to Badische Anilin- & Soda- Fabrik Aktiengesellschaft, Ludwigshafen/Rhine, Germany

Filed July 6, 1972, Ser. No. 269,456
Claims priority, application Germany, July 14, 1971, 2135085
Int. Cl. B01d 1/22; C07d 41/06
U.S. Cl. 203—89 2 Claims

1. A continuous process for separating caprolactam from a mixture containing from about 70 to 85 percent of caprolactam and from 15 to 30 percent of oligomers of caprolactam which comprises heating said mixture of caprolactam and oligomers to a temperature of from 250° to 350° C to obtain a melt; feeding said melt to a falling film evaporator held at atmospheric pressure or slightly above atmospheric pressure, whereby caprolactam is distilled off, and continuously removing said oligomers from said evaporator as bottoms.

3,855,081

CHEMICAL PROCESS

Christopher John Brown, Tadworth, and Roderick F. Neale, Great Boykham, both of England, assignors to BP Chemicals Limited, London, England

Continuation of Ser. No. 135,744, April 20, 1971, abandoned.
This application Sept. 10, 1973, Ser. No. 395,981
Int. Cl. B01d 3/10; C07c 57/04
U.S. Cl. 203—91 3 Claims

1. A method for improving the quality of acrylic acid monomer containing more than 20 ppm of protoanemonin having the structure

which comprises removing protoanemonin from the monomer by fractional distillation in a column having at least 10 distillation trays and operating with return of reflux to the column, and removing acrylic acid monomer substantially free from protoanemonin as a fraction boiling in the range of about 53° to 57°C at 20–22 mmHg from the upper part of the column.

3,855,082

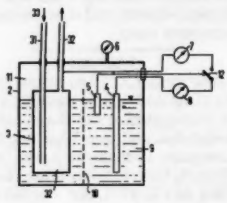
METHOD FOR MEASURING THE CHEMICAL CARBON AND/OR NITROGEN ACTIVITIES IN LIQUID METALS

Gerhard Hofer, Rottenbach, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 26, 1971, Ser. No. 119,156
Claims priority, application Germany, Mar. 4, 1970, 2010056
Int. Cl. G01n 27/46
U.S. Cl. 204—1 T 2 Claims

1. The method of determining the chemical activities of carbon and /or nitrogen, in liquid metal, such as in metallic coolants for nuclear reactors, with the aid of galvanic cells having an electrolyte connecting several electrodes; said method comprising the steps of: flowing said liquid metal through a measuring electrode disposed in a container and immersed in said electrolyte whereby the carbon and/or nitro-

gen content of said liquid metal is brought by diffusion into substantial equilibrium with that of the measuring electrode material; measuring the electrical potential difference between said measuring electrode and a reference electrode immersed in said electrolyte; measuring the electrical potential difference between a control electrode similarly immersed in said electroyte, and said reference electrode; and evaluating said potential differences as a measure of the activity differences in said respective electrodes and hence indirectly also of the liquid metal and said electrolyte in a virtually current-less manner.

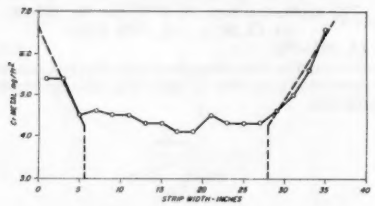


3,855,083

METHOD FOR THE UNIFORM ELECTROPLATING OF SHEET AND STRIP

Ralph F. Hoeckelman, Irwin Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed June 13, 1973, Ser. No. 369,644
Int. Cl. C23b *5/58*
U.S. Cl. 204—28 **7 Claims**



1. In the method for the continuous electroplating of a principally metallic coating onto a metal strip, which includes a. through a plating electrolyte, passing the strip in parallel relation to a generally rectangular face of an anode form having a length L and a width W*a*, wherein W*a* is approximately equal to the width of said strip, and

b. applying a current density between said anode form and said strip, at a magnitude and for a time, sufficient to effect the deposition of a substantially uniform desired coating weight along a width of said strip, said coating exhibiting an edge effect,

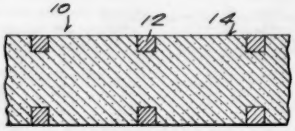
the improvement for substantially eliminating said edge effect, which comprises employing an anode configuration composed of two tandemly aligned fractions: the first fraction having a face which is generally rectangular, said first fraction face having a width, W*a*, and a length varying from about L/3 to 2L/3; the second fraction having a face which is generally trapezoidal, said second fraction face having a corresponding length of 2L/3 to L/3 respectively, and a width tapering approximately linearly and decreasing from a width W*a* to a width W*b*, wherein W*b* is approximately equal to the predetermined width of uniform coating weight produced by said rectangular anode form.

3,855,084

METHOD OF PRODUCING A COATED ANODE

Norman G. Feige, Jr., Ridgefield Ave., R.F.D. No. 1, South Salem, N.Y. 10590

Filed July 18, 1973, Ser. No. 380,325
Int. Cl. B01k *3/06;* **C23b** *11/00;* **C01b** *7/06*
U.S. Cl. 204—38 R **14 Claims**



1. A method of manufacturing an electrode comprising the steps of:

first, cold compacting metal particles chosen from the group consisting of titanium and lead to form an electrode having an extensively interconnected pore system between the particles;

second, depositing a first layer of manganese dioxide on the exterior surface of the compact and within the pores between particles by thermal decomposition of a solution of $Mn(NO_3)_2$;

and third, electrodepositing a layer of manganese dioxide on said first layer.

3,855,085

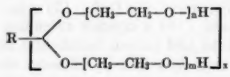
ACID ZINC ELECTROPLATING ELECTROLYTE, PROCESS AND ADDITIVE

John Derek Rushmere, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 14, 1973, Ser. No. 369,815
Int. Cl. C23b *5/12, 5/46*
U.S. Cl. 204—55 R **30 Claims**

1. A composition for providing bright zinc electrode deposits which comprises an aqueous acidic electrolyte composition containing at least one zinc compound providing zinc ions for electroplating zinc, a source of chloride ion, 0.05 to 20 g./l. of at least one nonionic polyoxyethylene compound, 0.05 to 2 g./l. of at least one ketone, and 0.05 to 20 g./l. of at least one carboxylic acid,

said polyoxyethylene compound being selected from compounds of the formula:



wherein $n+m \geq 10$, $x=1$ or 2, derived from a reaction of oxyethylene with a polyol selected from the group consisting of

2,4,7,9-tetramethyl-5-decyne-4,7 diol,

polyoxypropylene glycol of molecular weight at least about 900, and

N,N,N′,N′-tetrakis(polyoxypropylene glycol) ethylene diamine of molecular weight at least about 500,

and wherein R is defined by the selected polyol;

said ketone being selected from the group consisting of

4-phenyl-3-buten-2-one,

4-(4-methoxyphenyl)-3-buten-2-one,

4-(3,4-dimethoxyphenyl)-3-buten-2-one,

4-(3,4-methylenedioxyphenyl)-3-buten-2-one, and

4-(2-furyl)-3-buten-2-one; and

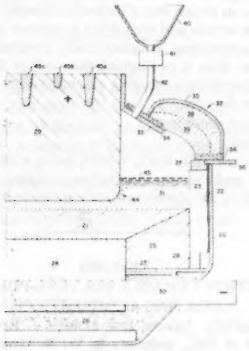
said carboxylic acid being selected from the group consisting of
benzoic acid,
cinnamic acid,
2-furylacrylic acid, and
nicotinic acid.

3,855,086

CARBON ANODE PROTECTION IN ALUMINUM SMELTING CELLS

William C. Sleppy, Belleville, Ill., and Ronald J. Campbell, Apollo, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed June 28, 1973, Ser. No. 374,803
Int. Cl. C22d *3/12*
U.S. Cl. 204—67 **4 Claims**



1. In the operation of a cell for the electrolytic reduction of Al_2O_3 dissolved in a cryolite bath to aluminum metal utilizing a carbon anode, the improvement comprising providing at the anode an atmosphere containing water in amounts effective for preventing anode dusting.

3,855,087

METHOD FOR PRODUCING RARE EARTH METAL-CONTAINING ALLOYS

Yoshio Yamanaka; Takashi Toide, and Hiromi Yamamoto, all of Takefu, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed Oct. 3, 1973, Ser. No. 402,887
Claims priority, application Japan, Oct. 11, 1972, 47-101786
Int. Cl. C22d *3/20*
U.S. Cl. 204—71 **16 Claims**

1. Method of producing an alloy compound of a rare earth metal and a light metal selected from the group consisting of magnesium and aluminum, which comprises formulating a salt bath by melting in molten state a composition of fluorides of a rare earth metal and lithium, introducing into said composition an oxide of the same light metal in said alloy and an oxide of the same rare earth metal in said alloy, and thereafter contacting with a cathode and subjecting the oxides of said light metal and the said rare earth metal to simultaneous electrolytic reduction, whereby the said alloy is deposited on the cathode in contact with said salt bath.

3,855,088

PROCESS FOR REMOVING CLUSTER ADHERING TO CATHODE DURING ELECTROLYSIS OF MANGANOUS SULFATE

Tetsuji Kosaka, Takehara, Japan, assignor to Mitsui Mining & Smelting, Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1973, Ser. No. 391,804
Int. Cl. C01b *13/14*
U.S. Cl. 204—96 **5 Claims**

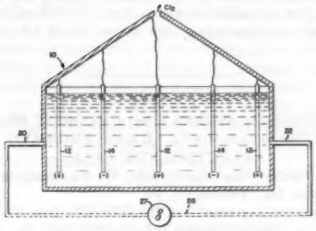
1. A process for removing cluster comprising alkaline earth metal sulfates, which cluster is deposited on a cathode during electrolysis of an aqueous sulfuric acid-manganous sulfate solution containing the alkali earth metal salts in the production of electrolytic manganese dioxide, which process comprises effecting the electrolysis of an aqueous sulfuric acid-manganous sulfate solution by use of the cathode having the cluster deposited on its surface as an anode to deposit the electrolytic manganese dioxide on the cluster, and giving an impact to the deposited manganese dioxide so that the cluster is peeled off together with the manganese dioxide.

3,855,089

PROCESS FOR THE ELECTROLYTIC REFINING OF HEAVY METALS

Hugh L. McCutchen, Gloucester Point, and Paul H. Cardwell, Zanoni, both of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Nov. 27, 1972, Ser. No. 309,899
Int. Cl. C22d *1/24, 1/14, 1/18*
U.S. Cl. 204—105 M **28 Claims**



1. In a process for refining by cathodically electrodepositing a heavy metal at the cathode while simultaneously evolving an elemental halogen at the insoluble anode from an aqueous electrolyte solution containing dissolved therein a halide of the heavy metal, the heavy metal being selected from the group consisting of cobalt, nickel, zinc, iron, tin and manganese, the improvement which comprises the presence in the electrolyte solution of a halide of a second metal selected from the group consisting of alkali metal and alkaline earth metal, the concentration of the halide of the second metal being at least about 60% of its saturation concentration in the electrolyte solution, whereby a hard, dense and smooth deposit of the heavy metal can be deposited at the cathode, in the absence of a buffering agent.

3,855,090

PROCESS FOR RECOVERING NICKEL SELECTIVELY

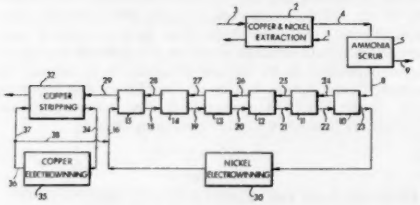
Roald R. Skarbo, Lexington, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed June 28, 1972, Ser. No. 266,981
Int. Cl. C22d *1/14, 1/16;* **B01d** *11/00;* **B01i** *1/04*
U.S. Cl. 204—106 **10 Claims**

1. A process for recovering pure copper and pure nickel from a water immiscible oxime extractant which comprises stripping an oxime extractant containing copper with an acid stream in a copper stripping step, said acid stream containing an acid of the type which forms a water soluble nickel salt or

a water soluble copper salt when reacted with nickel or copper, cycling a copper-rich stream from the copper stripping step to a copper electrowinning step, stripping an oxime extractant containing nickel in a nickel stripping step by contacting the oxime extractant with an aqueous acid solution said contacting of said extractant and said acid solution causing nickel ion transfer from the oxime extractant to the aqueous solution and hydrogen ion transfer from the aqueous solution to the oxime extractant in accordance with the equation:

$(R^{\circ}_2Ni)_{organic} + 2(H^+)_{aqueous} \quad (2R^{\circ}H)_{organic} + (Ni^{++})_{aqueous}$, where R° is the oxime organic moiety, the mole ratio



of hydrogen ion in the fresh aqueous acid solution to nickel ion in the fresh oxime extractant being maintained between about 1.8 and 2.2, cycling a nickel-rich stream from the nickel stripping step to a nickel electrowinning step and directing a portion of a copper depleted acid stream from said copper electrowinning step to said copper stripping step and the remainder of said copper depleted acid stream to said nickel stripping step at a rate sufficient to maintain the nickel concentration in said copper electrowinning step below about 10 grams per liter.

3,855,091

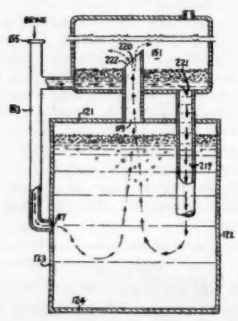
METHOD OF SEPARATING CHLORINE FROM CHLORINE-ANOLYTE LIQUOR FROTH OF AN ELECTROLYTIC CELL

Loyd W. Piester, New Martinsville, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 219,096, Jan. 19, 1972, abandoned. This application July 2, 1973, Ser. No. 376,087

Int. Cl. C01b *7/06*

U.S. Cl. 204—128 **4 Claims**



1. In the process of electrolyzing a brine in an electrolytic cell at a current above 2,500 amperes per square foot of cell horizontal area whereby a froth of chlorine and electrolyte is generated, the improvement comprising:

removing the froth from the electrolytic cell through froth removal means having a cross-sectional area of less than 0.10 square feet per thousand amperes to a disengaging tank;

changing the direction of flow of the froth prior to discharging the froth into the disengaging tank;

thereafter discharging the froth into the disengaging tank above the level of liquid therein, thereby separating the froth into liquid and gas fractions; and

returning the liquid so separated to the electrolytic cell below the surface of the electrolyte therein.

3,855,092

NOVEL ELECTROLYSIS METHOD

Kevin J. O'Leary, Cleveland Heights, Ohio, assignor to Electronor Corporation, Panama City, Panama

Continuation-in-part of Ser. No. 257,717, May 30, 1972, Pat. No. 3,776,834, which is a continuation-in-part of Ser. No. 104,740, Jan. 7, 1971, abandoned. This application Sept. 26, 1973, Ser. No. 400,707. The portion of the term of this patent subsequent to Dec. 4, 1990 has been disclaimed.

Int. Cl. C01b *7/06;* **B01k** *3/06*

U.S. Cl. 204—128 **3 Claims**

1. A method of electrolysis comprising passing an electric current through an aqueous electrolyte containing chloride ions between an anode and a cathode whereby chlorine gas is formed at the anode and the cation is reacted at the cathode, the anode comprising an electrically conductive substrate bearing on at least a portion of the surface thereof a solid solution-type coating consisting essentially of:

a. titanium dioxide,

b. ruthenium dioxide and

c. tin dioxide,

the mole ratio of TiO_2:$RuO_2 + SnO_2$ being within the range of 1.5 to 2.5:1 and the tin dioxide representing from 35 to 50 mole percent of the combined ruthenium and tin dioxide.

3,855,093

RADIATION CURABLE POLYENE-POLYTHIOL COATING COMPOSITIONS

James L. Guthrie, Ashton, and Francis J. Rendulic, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 209,369, Dec. 17, 1971, Pat. No. 3,787,303. This application Aug. 16, 1973, Ser. No. 388,860

Int. Cl. B01j *1/10, 1/12*

U.S. Cl. 204—159.15 **8 Claims**

1. A photocurable lacquer composition comprising (A) a polythiol component containing at least 2 — SH groups per molecule (B) the adduct of 2 moles of diallyl malate per mole of toluene diisocyanate as polyene; the relative amounts of polyene to polythiol being selected such that the mole ratio of ene to thiol is from about 0.2:1 to about 5:1; (C) from about 0.0005 to about 50 percent by weight of the composition of a photocuring rate accelerator component; (D) from about 1 to about 50 parts by weight per 100 parts by weight of the polyene-polythiol combination of a polyester-polyene prepared by reacting (a) phthalic anhydride and (b) ethylene glycol to form a polyester resin and capping said polyester resin with (c) trimethylolpropane diallyl ether, the mole ratio of (a): (b): (c) being about 3.1:3.1:0.02.

3,855,094

METHOD IN THE QUANTITATIVE AND QUALITATIVE DETERMINATION OF MOLECULES HAVING ANTIGENIC PROPERTIES BY IMMUNOELECTROPHORESIS

Anna Maija Teppo, Haukilahti, Finland, assignor to Orion-Yhtyma Oy, Helsinki, Finland

Filed Sept. 19, 1972, Ser. No. 290,381

Claims priority, application Finland, Sept. 24, 1971, 2678/71; Sweden, Dec. 30, 1971, 16888/71

Int. Cl. B01k *5/00*

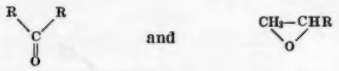
U.S. Cl. 204—180 G **7 Claims**

1. An immunoelectrophoretic method of quantitatively and qualitatively determining the presence in a gel matrix of mole-

cules which possess antigenic properties and contain free amino groups, comprising:

providing a gel matrix containing molecules whose properties are to be determined, said matrix comprising an environment which is stabilized against uncontrolled liquid convection in space, the electrochemical properties of said molecules being such that their net mobility does not appreciably deviate from the net mobility of antigens directed against antibodies in said matrix,

adding to said gel matrix containing said molecules a compound selected from the group consisting of:



where R is hydrogen or alkyl having not more than two carbon atoms,

and then passing an electric current through said gel matrix to transport immunoglobulins and therewith form precipitation zones.

3,855,095

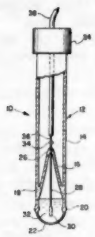
ELECTROCHEMICAL ELECTRODE ASSEMBLY AND METHOD OF MAKING SAME

Lynn B. Leonard, Fullerton, and Arne J. Petersen, Balboa, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 518,247, Jan. 3, 1966, abandoned. This application Jan. 13, 1969, Ser. No. 791,881

Int. Cl. C03b *23/00;* **G01n** *27/36*

U.S. Cl. 204—195 G **7 Claims**



1. An electrochemical electrode assembly comprising:

inner and outer glass tubes spaced apart to define an annular chamber;

a glass ring seal sealing said tubes to each other adjacent one end thereof;

an ion sensitive bulb sealed to at least one of said tubes at said one end;

an electrolyte filling said bulb;

said inner tube having a constriction therein intermediate said glass ring seal and the other end of said outer tube; an internal half-cell immersed in said electrolyte;

a wire extending through said constriction and being connected to said half-cell;

a second glass seal sealing said wire in said constriction; and said outer glass tube being devoid of a concentric glass ring seal between said glass ring seal and the other end of said outer tube.

3,855,096

ELECTROCHEMICAL CELLS

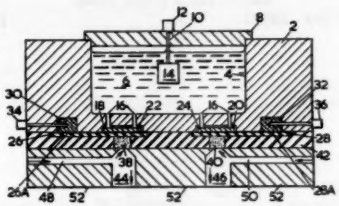
Imanuel Bergman, Sheffield, England, assignor to National Research Development Corporation, London, England

Filed May 4, 1972, Ser. No. 250,246

Claims priority, application Great Britain, May 6, 1971, 13463/71

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 P **11 Claims**



1. An electrochemical monitoring system for detecting the presence of active substance in a fluid, consisting of an electrochemical cell having first and second metalized membrane working electrodes, a counter electrode and, in use, an electrolyte, the first and second working electrodes and the counter electrode adapted to contact the electrolyte, the first working electrode also capable of being exposed to said fluid, whereby in the absence of an active substance substantially identical background currents flow between the counter electrode and the first working electrode and between the counter electrode and the second working electrode, electrical measuring means for measuring the electrical current through said first working electrode, and electrical feedback means for automatically adjusting the potential of the counter electrode such that the current through the second working electrode is maintained at a substantially constant magnitude, the background current through the first working electrode also maintained at a substantially constant magnitude.

3,855,097

ION-SELECTIVE ELECTRODE

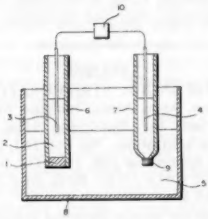
Michael Sharp, Tallvagen 43A, 902 39 Umea, and Gillis Johansson, Trastvagen 4 A, 902 37 Umea, both of Sweden

Filed June 19, 1972, Ser. No. 264,390

Claims priority, application Sweden, June 17, 1971, 7856/71

Int. Cl. G01n *27/46*

U.S. Cl. 204—195 M **18 Claims**



1. An ion-selective electrode for the analysis of the concentration of inorganic, organic and metal-organic ions in a solution, comprising an electrically insulating electrode holder, an electroactive plate in said electrode holder, and an electric conductor connected to said electroactive plate, characterized in that the electroactive plate consists of a salt in which

one ion is a radical-ion possessing an electron which is not spin-paired.

3,855,098

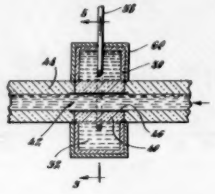
ION-RESPONSIVE ELECTRODE CONSTRUCTION

Kenneth S. Fletcher, III, Norfolk, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 064,952, Aug. 19, 1970,. This application Jan. 24, 1973, Ser. No. 326,520

Int. Cl. G01n *27/36, 27/46*

U.S. Cl. 204—195 G **1 Claim**



1. In an electrode for use in measuring the activity or concentration of a predetermined ion in a test solution, said electrode being of the type including a container holding an electrolyte solution and having at one wall portion thereof a thin ion-sensitive membrane exposed at its inner surface to said electrolyte and adapted to be exposed at its outer surface to the test solution for the purpose of developing an electrical potential responsive to the activity or concentration of the predetermined ion;

that improvement in the foregoing type of electrode which comprises:

a rigid member of porous inert material serving as part of said wall portion of said container and arranged for exposure at one surface thereof to said electrolyte, said rigid member having a higher melting temperature than said ion-sensitive membrane;

said rigid member carrying on a surface thereof opposite said one surface said thin ion-sensitive membrane in the form of a separate member fused to said rigid member with the ion-sensitive membrane material interengaged with pores of the rigid member to effect a tight-locking seal engagement between said two members;

the porosity of said inert material providing continuous channels through which said electrolyte can travel to contact the material of said membrane in pores at the interface between said two members;

the opposite surface of said membrane being arranged for exposure to said test solution;

said porous material being substantially thicker and mechanically stronger than said membrane.

3,855,099

ELECTRODE FOR ANODIC STRIPPING VOLTAMMETRY

Wayne R. Matson, Ayer, Mass., assignor to Environmental Sciences Associates, Inc., Burlington, Mass.

Continuation-in-part of Ser. No. 168,161, Aug. 7, 1971, abandoned. This application Jan. 29, 1973, Ser. No. 327,788

Int. Cl. G01n *27/26;* **B01k** *3/04, 3/06*

U.S. Cl. 204—195 F **10 Claims**

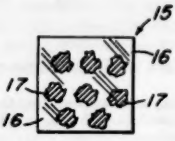
1. An electrode for anodic stripping voltammetry adapted for testing for at least one predetermined ion in an aqueous sample comprising

a porous, electrically conducting rod having an active lateral electrode surface of measured predetermined area across which essentially the entire aqueous sample can be circulated, said lateral surface being adapted to be positioned essentially virtically when the electrode is employed in a working mode,

said rod comprising particles of an average size between about 0.2 and about 2 microns adhering together to form said rod,

an impregnated film forming material sealing the pores of said rod and preventing penetration thereof by said aqueous sample;

the electrode surface being polished and having a structurally smooth surface comprising a surface whose area comprises a continuous surface of said film forming material and a multiplicity of islands of said electrically conducting rod material each having an average area less than about 1×10^{-12} square centimeters,



and deposited on said islands a multiplicity of islands of metal lower in the electro-motive series than the ion to be tested and acting to retain said ion upon electrolytic reduction and to release said ion in response to measured electrolytic oxidation;

the potential at which said release is brought about thus being an identification of said ion, and the quantity of electrolytic current flow accompanying said release being a measure of the quantity of said ion,

said electrode metal being selected from the group consisting of gold, silver, bismuth and platinum.

3,855,100

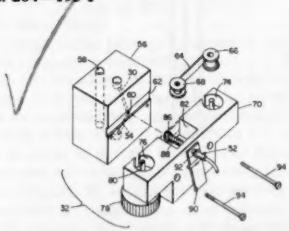
ELECTROCHEMICAL ELECTRODE STRUCTURE

Ihsan A. Haddad, Bedford, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed Apr. 13, 1973, Ser. No. 350,774

Int. Cl. G01n *27/36, 27/40, 27/46*

U.S. Cl. 204—195 F **13 Claims**



1. An electrochemical electrode system including a sensing electrode system that includes a first chamber adapted to contain a sample to be analyzed and a sensing electrode in communication with said first chamber,

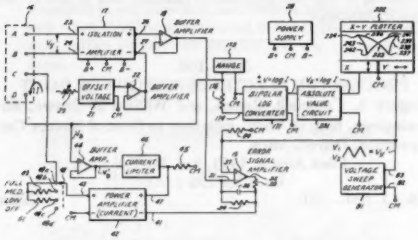
a reference electrode system that includes a second chamber adapted to contain an electrolyte and a reference electrode in communication with said second chamber,

and an ionic junction structure including first passage structure connected to said first chamber, said first passage structure having an opening therein, second passage structure connected to said second chamber, said second passage structure having an opening therein, said openings being in juxtaposed relation, and a porous member having a section disposed between said openings to permit restricted flow between said openings, said member being movable to remove said one section from between said openings and concurrently to place another section between said openings.

3,855,101
DYNAMIC ANALYZER

Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jan. 24, 1974, Ser. No. 436,250
Int. Cl. B01k *3/00*; **G01n** *27/42*
U.S. Cl. 204—195 R **39 Claims**



1. A dynamic analyzer comprising:

a. a plurality of terminals forming an interface between the analyzer and an external system having voltage-current related properties;

b. an input circuit including a pair of said terminals and an output means for producing a first voltage signal representative of the potential difference between said terminal pair;

c. voltage sweep generator means providing a linear sweep voltage signal from a first magnitude to a second magnitude;

d. current source means having an output circuit for passing bidirectional output current between a pair of said terminals whereby a polarization voltage is induced at said first mentioned terminal pair, and said current source means having an input circuit for receiving an input voltage signal for controlling the magnitude of said output current in said output circuit;

e. error signal amplifier means for generating a second voltage signal indicating the difference between said first voltage signal from said output circuit and said linear sweep voltage signal in an input circuit of said error signal amplifier; said second voltage signal being applied to said input circuit of said current source means for effecting a bidirectional flow of output current in the output circuit thereof whereby said potential difference between said first mentioned terminal pair precisely tracks said linear sweep voltage signal;

f. log converter means sensing said output current in said output circuit of said current source means and providing a continuous potential signal having a polarity representative of the flow direction of the output current and said potential signal having a magnitude representative of the logarithm of the magnitude of the output current, and said potential signal changing polarity upon a change in the flow direction of said output current; and

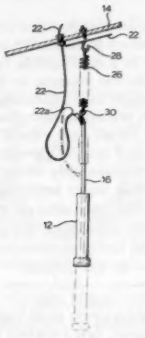
g. readout means for providing a readout of said linear sweep voltage signal with said potential signal for a selected period of time.

3,855,102
WATER TANK ANODE SUSPENSION

James D. Palmer, 15 Westmorland Ct., London, Canada

Filed Sept. 6, 1973, Ser. No. 394,565
Int. Cl. C23f *13/00*
U.S. Cl. 204—196 **5 Claims**

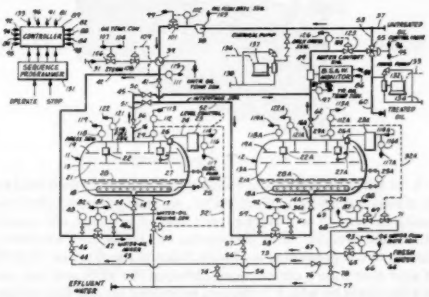
1. In an outdoor water storage tank having cathodic protection means for inhibiting corrosion which includes anode means disposed in the tank, the improvement of anode suspension means having one end rigidly secured to the tank and anode means secured at the other end thereof, and metal coil tension spring means secure to said anode suspension means and disposed intermediate the ends thereof to permit movement of said anode means with respect to said rigidly secured end of said suspension means.



3,855,103
ELECTRICAL TREATER SYSTEM FOR PRODUCING A COMBUSTIBLE FUEL

Theron D. McLaren, Houston, and Jack T. Sawdy, Pasadena, both of Tex., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 199,447, Nov. 17, 1971, abandoned.
This application Jan. 10, 1974, Ser. No. 432,381
Int. Cl. B03c *5/02*; **G05d** *11/00*
U.S. Cl. 204—306 **15 Claims**



1. An electrical treater system for producing a low sodium ion content combustible fuel comprising:

a. vessel means having emulsion inlet means, oil phase outlet means and water phase outlet means, and said vessel means containing electrode means energizable from an external power source to create an electrical field for resolving water-in-oil emulsion into a treated oil phase and an effluent water phase;

b. Supply means for providing streams of untreated oil having a high sodium ion content and a preset amount of fresh water to a mixing means positioned upstream of said vessel in said emulsion inlet means, said mixing means adjusted for intermixing of the fresh water in a preset finely divided state into the untreated oil to produce the emulsion applied to said emulsion inlet means on said vessel means for introduction of the emulsion into a substantially unseparated state into the electrical field, and the emulsion having the oil as the external phase and dispersed fresh water as the internal phase;

c. a plurality of monitoring means for generating a plurality of signals indicating respectively, the preset amount of fresh water supplied to said mixing means for intermixing of the fresh water in the preset finely dispersed state into

the untreated oil and the water content of the treated oil removed from said oil phase outlet means of said vessel means;

d. said oil phase outlet means connected to a control valve having a first position to direct the treated oil to a subsequent utilization as a combustible fuel, and said control valve having a second position to divert the treated oil from said subsequent utilization; and

e. controller means receiving said plurality of signals from said plurality of monitoring means, and said controller means adjusting said control valve from the second position to the first position only when said signals indicate the amount of fresh water intermixed in the finely dispersed state into the untreated oil to produce the emulsion and the water content of the treated oil are within preset operational limits to produce a combustible fuel with reduced sodium ion content.

3,855,104

PROCESS AND APPARATUS FOR THE ELECTROLYSIS OF HCL CONTAINING SOLUTIONS WITH GRAPHITE ELECTRODES WHICH KEEP THE CHLORINE AND HYDROGEN GASES SEPARATE

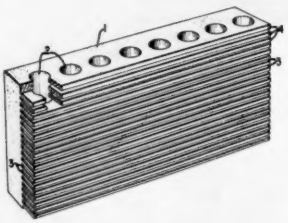
Georg Messner, Munich, Germany, assignor to Oronzio De Nora Impianti Elettrochimici S.p.A., Milan, Italy

Filed Mar. 15, 1973, Ser. No. 341,593

Claims priority, application Germany, Mar. 21, 1972, 2213603

Int. Cl. B01k *3/04, 3/10*

U.S. Cl. 204—129 **18 Claims**



1. In a hydrochloric acid electrolyzer, means to feed acid to be electrolyzed to said electrolyzer, means to conduct electrolyzing current to said electrolyzer, spaced graphite electrodes in said electrolyzer, slots and blades on the faces of said electrodes, two separated sets of bore holes in the interior of each of said electrodes, connections between the slots and one set of bore holes by which hydrogen produced on one face of the electrodes and depleted acid are conveyed to one set of bore holes and connections between the slots and another set of bore holes by which chlorine produced on another face of the electrodes and depleted acid are conveyed to another set of bore holes and means to conduct hydrogen and depleted acid from one set of bore holes and chlorine and depleted acid from another set of bore holes to the outside of the electrolyzer.

3,855,105

THIOPHOSPHORYLATING A SATURATED HYDROCARBON GROUP

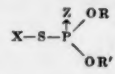
William R. Diveley, Oakwood Hills, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 514,652, Dec. 17, 1965, abandoned. This application June 16, 1969, Ser. No. 833,741

Int. Cl. B01j *1/10*

U.S. Cl. 204—162 R **24 Claims**

1. A process for thiophosphorylating a saturated carbon of an organic compound, which carbon is characterized by at least one hydrogen radical replaceable under free radical conditions, which comprises effecting by free radical catalysis at about 0°–150°C. reaction of said organic compound and a halothiophosphate of the formula



wherein X is a halo radical, Z is selected from the group consisting of the oxo and thioxo radicals, and R and R′ are organic radicals.

3,855,106

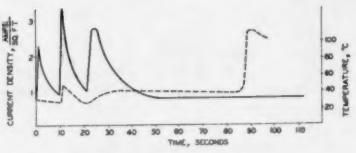
PROCESS FOR ELECTRODEPOSITION OF PAINT

Gregory A. Campbell, Romeo, and William B. Brown, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed June 4, 1973, Ser. No. 366,580

Int. Cl. C23b *13/00*

U.S. Cl. 204—181 **4 Claims**



1. In the method of depositing a base solubilized, resinous, polycarboxylic acid material from an aqueous dispersion thereof onto an electrically conductive, anodic substrate immersed in said dispersion by passing a direct electric current through said dispersion and substrate whereby a resinous film of predetermined thickness is deposited on said substrate, there being two discernible stages in the process of depositing said film: (a) a first stage in which the current density increases due to an initially fixed or increasing voltage, below the nominal rupture voltage of said material, and relatively low film resistance and (b) a second stage in which the current densty decreases to a low generally constant value because of increased resistance of the growing film, the improvement comprising

maintaining said current density during said second stage of the film deposition process at a predetermined value greater than said low value by increasing the deposition voltage to above said nominal rupture voltage as required to maintain said current density value for a time sufficient to complete the film deposition, said predetermined current density value being a maximum value found experimentally to be suitable for obtaining maximum film throw without damaging the film by boiling aqueous or cosolvent liquid therein.

3,855,107

CLEANING AND PLATING APPARATUS

Robert McInnes, 2601 Davison Rd., Flint, Mich. 48506

Continuation-in-part of Ser. No. 89,409, Nov. 13, 1970, abandoned. This application May 10, 1972, Ser. No. 252,313

Int. Cl. B65g *49/02*

U.S. Cl. 204—201 **25 Claims**

1. In an apparatus for cleaning and plating articles, the combination comprising

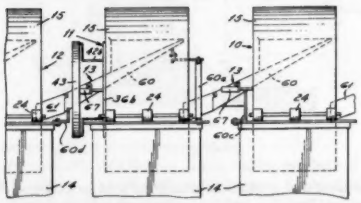
a plurality of containers adapted to contain liquid treating material,

a barrel adapted to be at least partially submerged in liquid in each said container,

each said barrel having a longitudinal axis,

means for supporting each said barrel rotatably about a fixed generally horizontal axis so that a portion of the barrel is submerged in liquid in said container when liquid is in the container,

each said barrel comprising a cylindrical plastic wall,
each said barrel having radial plastic end walls, each end wall having an opening therethrough along the longitudinal axis of the barrel,
each said barrel having a plurality of circumferentially spaced baffles on the inner periphery thereof extending axially between the end walls,
said baffles extending generally radially inwardly and forming an acute angle with the inner periphery of the barrel and spaced from said openings such that when the barrel is rotated in one direction, said baffles agitate the articles, and when said barrel is rotated in the opposite direction, said baffles elevate the articles and the cause them to drop,



and chute means extending at an angle from the interior of one said barrel adjacent one end wall through the other end wall to the interior of the succeeding barrel such as to guide articles dropped by the baffles by gravity to the succeeding barrel,
means for mounting said chute means in fixed relationship independently of said barrels,
and means associated with at least one of said barrels for providing an electrical circuit for plating,
each said chute means comprising a first portion and a second portion,
said portions forming progressively decreasing angles with the horizontal as the chute extends from one said barrel to the adjacent said barrel.

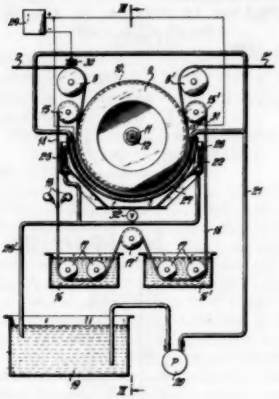
3,855,108

CONTINUOUS STRIP ELECTROPLATING APPARATUS

Walter Bolz, Mutschelbach; Horst Herzog, Kleinsteinbach; Alfred Herzog, Singen, and Hans J. Neese, Eisingen, all of Germany, assignors to Dr. Eugene Durrwachter Doduco, Pforgheim, Germany

Filed Jan. 24, 1974, Ser. No. 436,116
Claims priority, application Germany, May 17, 1973, 2324834
Int. Cl. C23b *5/58, 5/68, 5/72*
U.S. Cl. 204—206 **6 Claims**

1. Apparatus for continuously electroplating a longitudinally moving elongated strip having a conductive surface comprising, in combination:
a. a support;
b. a wheel mounted on said support for rotation about an axis and having a circumferential face of insulating material;
c. guide means for guiding said moving strip into engagement with said face over a predetermined arc;
d. a tubular anode carrier mounted on said support and extending about said wheel and said strip substantially in said arc;
e. a conductive anode member mounted on said carrier spacedly opposite said face,
1. said carrier and said anode member being formed with respective aligned discharge orifices communicating with the interior of said carrier and directed toward said axis;
f. conductive means for connecting said strip and said anode member to respective terminals of a source of electroplating current; and



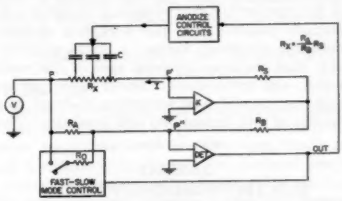
g. a conduit communicating with said interior for supplying electrolyte to said carrier.

3,855,109

APPARATUS FOR HIGH SPEED RESISTOR TRIMMING

Malcolm C. Holtje, Concord, Mass., assignor to General Radio Company, Concord, Mass.

Filed Apr. 9, 1973, Ser. No. 349,061
Int. Cl. B01k *3/00*
U.S. Cl. 204—228 **9 Claims**

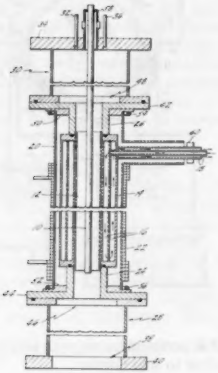


1. A thin film resistor anodizing apparatus having, in combination, a bridge circuit containing as arms the resistor-to-be-anodized and standard and ratio-arm-resistances, with the said resistor being continuously connected between a grounded voltage source and a virtual ground terminal provided by operational amplifier means connected to provide feedback across said standard resistance; means for supplying anodizing current to said resistor to vary its value; means responsive to the bridge measuring current for comparing the values of said resistor and said standard resistance; means for cyclically and alternately applying said anodizing current from said supplying means to said resistor and monitoring the comparing means, with the cycle being proportioned to apply anodizing current during a period that is most of the cycle, for rapid trimming of the resistor, and to provide circuit settling and monitoring of the comparing means during a period that is a minor portion of said cycle, for determining whether the value of the resistor has reached the predetermined by the standard resistance; and means operable when the resistor value approaches that determined by the standard resistance for reducing the period of applied anodizing current to a minor portion of the said cycle, for slow trimming while permitting increasing the settling period.

3,855,110
CYLINDRICAL RF SPUTTERING APPARATUS

Daniel J. Quinn, Manchester, and Edouard L. Paradis, Willimantic, both of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Nov. 15, 1973, Ser. No. 416,318
Int. Cl. C23c *15/00*
U.S. Cl. 204—298 **5 Claims**



1. Plasma utilization apparatus comprising

a cylindrical electrode adapted to support a target material on the inner circumference thereof, said electrode defining a workpiece chamber adapted to contain a workpiece, means including a source of rf potential applied to said electrode for forming a plasma within said workpiece chamber, said plasma interacting with said target material and said workpiece,

and a grounded cylindrical termination chamber connected to at least one end of said workpiece chamber and being electrically insulated from said workpiece chamber, said termination chamber having a cross-sectional area greater than the cross-sectional area of said workpiece chamber, said termination chamber having an aperture therein aligned with said workpiece chamber to permit expansion of said plasma into said termination chamber.

3,855,111
ELECTROPHORESIS APPARATUS

William B. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Division of Ser. No. 344,144, March 23, 1973, Pat. No. 3,795,600, which is a continuation-in-part of Ser. No. 226,016, Feb. 14, 1972,. This application Oct. 30, 1973, Ser. No. 411,144
Int. Cl. B01k *5/00*
U.S. Cl. 204—299 **12 Claims**

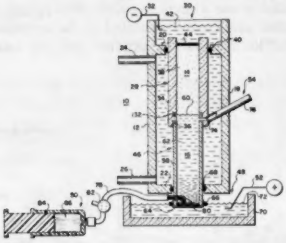
1. Apparatus for electrophoresis of a mixture of different molecular species comprising:

a first housing adapted to contain a first anticonvection medium;

a second housing adapted to contain a second anticonvection medium said second housing having first and second ends;

said apparatus further comprising attachment means for permitting the first housing and said first end of said second housing to be easily attached to and separated from each other while permitting said first and second anticonvection media to be in intimate contact when said first and second housings are attached, whereby said second housing may be removed while said different molecular species are contained in it for additional processing of said second anticonvection medium;

electric means for substantially separating by electrophoresis at least some of said different molecular species in said first anticonvection medium and for moving said separated molecular species by electrophoresis into said second anticonvection medium; and conduit means not moving fluid between a location outside said second

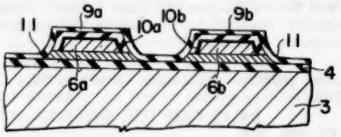


housing and a location proximate said second end of said second housing without contacting said second medium near said first end of said second medium, whereby fluid may be introduced or removed from the second end of said second housing to change the position of said second anticonvection medium without substantially mixing the separated molecular species.

3,855,112
METHOD OF MANUFACTURING INTERCONNECTION SUBSTRATE

Akihiro Tomozawa, Tokyo; Kensuke Nakata, Tokorozawa; Akira Kikuchi, and Takashi Agatsuma, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 7, 1974, Ser. No. 431,556
Claims priority, application Japan, Jan. 12, 1973, 48-5979
Int. Cl. C23b *5/48;* **B41m** *3/08;* **B01j** *17/00*
U.S. Cl. 204—15 **10 Claims**



1. A method of manufacturing an interconnection arrangement on a substrate comprising the steps of:

a. forming a first metallic layer overlying the surface of a supporting substrate;

b. forming a second metallic layer on the surface of said first metallic layer;

c. shaping the side portions of said second metallic layer to have a gradually sloped surface;

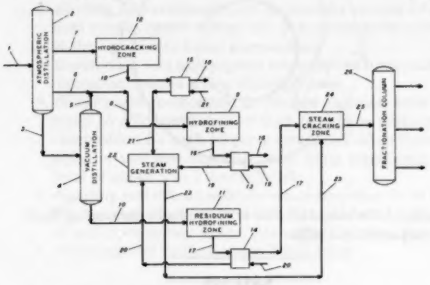
d. forming a porous insulating film covering the entire exposed surfaces of said second metallic layer; and

e. converting the surface portion of said second metallic layer facing said porous insulating film into a relatively thin, non-porous insulating layer which directly covers said second metallic layer and is disposed beneath said porous insulating film.

3,855,113
INTEGRATED PROCESS COMBINING HYDROFINING AND STEAM CRACKING

George D. Gould, Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 21, 1972, Ser. No. 317,313
Int. Cl. C10g 23/00
U.S. Cl. 208—89 1 Claim

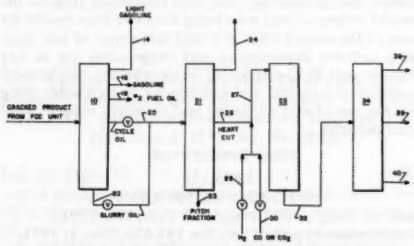


1. An integrated process comprising:
a. atmospheric distilling a crude oil to produce a heavy atmospheric gas oil and an atmospheric residuum;
b. vacuum distilling said atmospheric residuum to produce a vacuum residuum and a vacuum gas oil;
c. hydrofining said vacuum residuum in a first hydrofining zone to produce a hydrofined vacuum residuum;
d. hydrofining said heavy atmospheric gas oil and said vacuum gas oil in a second hydrofining zone to produce a hydrofined oil and heat;
e. recovering at least part of the heat produced in step (d);
f. generating superheated steam, using the heat recovered in step (e) as a portion of the energy required to produce said superheated steam; and
g. contacting said hydrofined vacuum residuum and said superheated steam in a steam-cracking zone to produce low sulfur-content steam cracked products.

3,855,114
PROCESS FOR PRETREATING MIXED HYDROCARBON DEALKYLATION STOCK

William S. Green, Columbus, and John W. Newman, Ashland, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 163,845, July 19, 1971, abandoned. This application Apr. 27, 1973, Ser. No. 355,089
Int. Cl. C10g 11/04, 13/04
U.S. Cl. 208—121 4 Claims



1. A process for preparing a hydrocarbon mixture containing paraffinic, aromatic and alkyl substituted aromatic hydrocarbons for subsequent hydrodealkylation, said mixture having a boiling point of between about 400°F. and about 550°F. comprising:
a. contacting said hydrocarbon mixture with a gas consisting of carbon dioxide in the absence of hydrogen added from sources extraneous to said process and in the presence of a catalyst selected from the group consisting of nickel oxide and molybdena on alumina, and zinc chromite; and
b. fractionating the liquid product obtained from (a) into a fraction boiling between about 400°F. and about 550°F.,
thereby providing a suitable hydrodealkylation feedstock.

3,855,115
AROMATIZATION PROCESS USING ZINC AND RHENIUM MODIFIED ZSM-5 CATALYST

Roger A. Morrison, W. Deptford Twsp., N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 25, 1972, Ser. No. 300,546
Int. Cl. C10g 35/06; C07c 5/22
U.S. Cl. 208—135 9 Claims

1. In the processing of a feed of C_2 to 400°F hydrocarbon compounds by containing such with a ZSM-5 type of synthetic aluminosilicate zeolite catalyst, having a silica to alumina ratio of at least about 15, having been made utilizing an organic cation, having zinc incorporated thereinto, and having the ability to significantly increase the aromatics content of said hydrocarbon feed at about 500° to 1500°F and a WHSV of about 0.1 to 15 under conditions sufficient to significantly increase the weight proportion of aromatics in the product as compared to the feed; the improvement, whereby reducing the production of naphthalenes and reducing coke formation on the catalyst during such processing, which comprises using as said catalyst said zeolite incorporating said zinc modified by the exchange of rhenium thereinto.

3,855,116
METHOD FOR SEPARATION OF EMULSION PREPARED IN MICROBIOLOGICAL DEWAXING OF PETROLEUM FRACTIONS HAVING DISTILLATION RANGE FROM 230 TO 450

Vulf Matveevich Medem, Prospekt Lenina 67, Kv. 54; Sergei Andreevich Boldrev, Ulitsa Lesnaya, 23, Kv. 1, both of Orsk; Leonty Petrovich Karpenko, Ulitsa Televizionnaya, 2, Kv. 202; Rafik Tsaturovich Dolukhanov, Ulitsa Polyarnaya, 9, Korpus, Kv. 127, both of Moscow, and Nikolai Sergeevich Sergeev, Prospekt Lenina 67, Kv. 54, Orsk, all of U.S.S.R.

Filed Mar. 23, 1972, Ser. No. 237,499
Int. Cl. C10g 33/04
U.S. Cl. 208—188 2 Claims

1. A method for separation of an emulsion prepared in the microbiological dewaxing of petroleum fractions having a distillation range from 230° to 450°C. and which emulsion contains a mineral aqueous medium, dewaxed product and yeast, consisting of mixing said emulsion with a 2–5 per cent aqueous ammonia-soda solution having an ammonia-soda ratio by weight of 1 to 4:4 to 1 at a temperature of from 60°C. to 100°C. consuming said solution in an amount in a range of 15 through 50 kg per ton of the starting petroleum fractions while impairing the stability of said emulsion and allowing the mixture to settle into separate layers.

3,855,117
GRAPHITE PELLETS

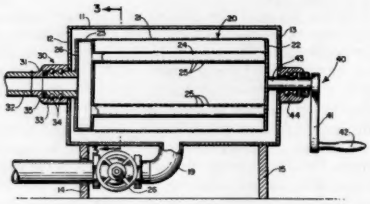
John Roland Cracknell, Esher, and Aleksander Jerzy Groszek, London, both of England, assignors to The British Petroleum Company Limited, London, England

Division of Ser. No. 98,029, Dec. 14, 1970,. This application June 5, 1973, Ser. No. 367,153
Int. Cl. C10g 43/04
U.S. Cl. 208—307 8 Claims

1. A process for the separation of n-paraffins and/or polar compounds selected from the group consisting of aromatics, sulfur and nitrogen compounds from a mixture with other hydrocarbons, which process comprises contacting said mixture with pellets consisting essentially of 50–95% weight of a vacuum or gas ground graphite having a surface area of 50–2,000 m^2/gm (BET) and, as a binder, 5–50% weight of a finely divided alumina, to adsorb selectively the n-

hydrocarbons under a pressure sufficiently high to maintain the mixture in the liquid phase and at a temperature in the range −50°-200°C.

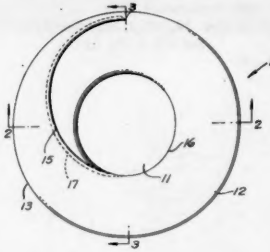
3,855,118
WELL SAMPLE WASHER
Raymond F. Mikolajczyk, 6153 Carlisle Ct., Orleans Parish, La. 70114
Filed Dec. 6, 1971, Ser. No. 204,978
Int. Cl. B07b *1/22*
U.S. Cl. 209—270 **2 Claims**



1. Well sample washer means comprising:
a. stationary cylindrical case means having an access opening and a drain opening;
b. horizontally mounted cylindrical foraminous cage means rotatably mounted within said stationery case; said cage means having an access opening provided with a sliding door slidably attached to said cage means;
c. wash and spray manifold means having a main distribution chamber portion and being further defined as comprising four oblong perforated tube portions extending essentially along the longitudinal axis of said manifold means and which are spaced essentially equidistant on about 90° centers and in open communication therewith, said cylindrical foraminous cage means being affixed to and mounted upon said manifold means and said oblong perforated tube portions which extend lengthwise of said cage means, said tube portions being oriented whereby the perforations therein face inward of said cage means such that sample material when caused to move over the inner peripheral surface of said cage means is contacted by said tube portions which serve as mixing baffles;
d. means for rotating said cage means comprising a hand crank whereby an operator can rotate siad cage means by hand; and
e. swivel joint means affixed to said cage means and operably connected to said manifold means and a source of pressurized liquid whereby said manifold means can be rotated within said cage means while liquid under pressure if forced through said manifold means and into said cage means through the perforations in said tubes such that well sample means contained within said cage means are impinged upon and washed while being agitated by said perforated tube portion.

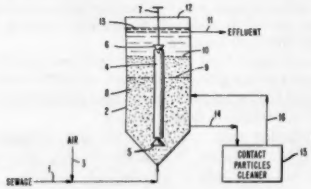
3,855,119
GOLD PAN
Russell D. Stephenson, 155 W. Snell St., Sonora, Calif. 95370
Filed Aug. 15, 1973, Ser. No. 388,549
Int. Cl. B03b *3/00*
U.S. Cl. 209—447 **2 Claims**

1. In a gold pan, a circular generally flat bottom wall and an upwardly and outwardly sloping side wall integrally secured to the bottom wall along the peripheral edge thereof, said side wall having an outer peripheral edge, a deep spiral riffle integrally formed in said side wall and extending spirally inwardly and downwardly from points adjacent the peripheral edge of said side wall to a point adjacent the peripheral edge of said bottom wall, and said riffle having an overhang opening toward the center of the gold pan, said riffle being formed by a



portion of the side wall that is of gradually increasing thickness adjacent said riffle.

3,855,120
OXYGENATION OF WASTE WATER
Paul W. Garbo, 48 Lester Ave., Freeport, N.Y. 11520
Continuation of Ser. No. 161,167, July 9, 1971, abandoned. This application July 5, 1973, Ser. No. 376,607
Int. Cl. C02c *1/02*
U.S. Cl. 210—3 **19 Claims**



1. The improved process for treating BOD-containing water by biochemical oxygenation which comprises flowing said BOD-containing water and oxygenating gas simultaneously up through an elongate mass of solid contact particles having a maximum dimension not exceeding 10 millimeters, said mass containing active biomass, regulating the upflow of said BOD-containing water and said oxygenating gas to effect expansion and turbulence of said mass without effecting transport of said solid contact particles away from the expanded and turbulent mass, said expansion of said mass increasing the volume of said mass when in a settled state by at least about 10% but the expanded volume of said mass being not more than double the volume of the settled mass, and said turbulence of said mass causing uniform dispersion of said oxygenating gas as tiny bubbles in said BOD-containing water whereby biochemical oxygenation is achieved, and withdrawing treated water rising above the top of said expanded and turbulent mass of solid contact particles.

3,855,121
BIOCHEMICAL PROCESS
Alfredo A. Gough, 509 Granada, El Paso, Tex. 79912
Continuation-in-part of Ser. No. 194,476, Nov. 1, 1971, abandoned, which is a continuation of Ser. No. 5,908, Jan. 26, 1970, abandoned. This application May 8, 1972, Ser. No. 251,056
Int. Cl. C02c *1/00, 5/00*
U.S. Cl. 210—11 **25 Claims**

1. A process for making a biologically active composition comprising:
1. forming in a fermentation zone a liquid composition comprising about 6 to 33% cow manure containing colos-

trum by volume of said liquid composition, 0.2 to .52 ounces of a fungus cell source per square foot of zone cross-sectional area, 0.003 to 0.052 ounces casein of milk for each 2 feet or part thereof of zone diameter, a protozoa inhibitor in an amount sufficient to inhibit protozoa formation in said zone and water, said liquid composition being maintained at a level of about 12 to 16 feet in height;

2. allowing said composition to ferment for at least 14 days until a milky-green biologically active composition forms at the top of said liquid composition;
3. transferring said milky-green composition from said fermentation zone to a first digestion zone;
4. diluting said composition in the first digestion zone with water to a concentration of 0.25 to 4 parts milky-green composition for each 10 parts water, said diluted composition in said first digestion zone being maintained at a level of about 3 to 7 feet in height;
5. digesting said diluted milky-green composition for at least 20 days until a brilliant green liquid layer forms at the top of said composition in said first digestion zone; and
6. removing said brilliant green liquid layer.

3,855,122
PROCESS FOR THE PREPARATION OF ANISOTROPIC SEMI-PERMEABLE MEMBRANES OF POLYARYL ETHER/SULPHONES

Jack Bourganel, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed May 19, 1972, Ser. No. 254,885
Claims priority, application France, May 24, 1971, 71.18634
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **23 Claims**

1. Process for preparing an anisotropic sulphonated polyaryl ether/sulphone membrane which comprises the following steps, in sequence:

i. casting a solution containing from about 0.1 to 10% by weight of an amine salt and having a concentration between about 5 and 605 w/v of solution of a sulphonated polyaryl ether/sulphone possessing between about 0.1 and 2 meq/g of sulphonic acid groups and a reduced specific viscosity of between about 40 and 200 cm^3/g (measured as a 2 g/l solution in dimethylformamide at 25°C), on a support;
ii. gelling the polymer layer formed on the support in the step (i);
iii. immersing the supported film from step (ii) in water, as a coagulation bath, said bath having a temperature between about 0°C. and 100°C., for between about 30 seconds and 60 minutes; and
iv. recovering the membrane produced from step (iii).

3,855,123
UPFLOW-DOWNFLOW SORPTION PROCESS

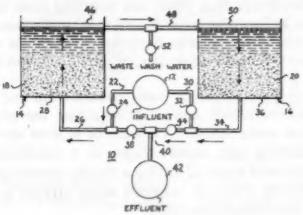
George E. Strudgeon, Erie, Pa., and Andrew W. Loven, Vienna, Va., assignors to Zurn Industries, Inc., Erie, Pa.

Filed Nov. 8, 1972, Ser. No. 304,601
Int. Cl. B01d *15/06*
U.S. Cl. 210—31 **3 Claims**

1. A process for treating liquid by passing the liquid through beds of granular solid, activated carbon comprising the steps of:

a. providing at least first and second series-connected columns, each column containing a bed of granular solid, activated carbon;
b. passing influent liquid to the lower end of the first column;
c. forcing the liquid to pass upwardly through the bed of activated carbon contained in the first column;
d. passing the liquid from the upper end of the first column to the upper end of the second column;
e. receiving the effluent liquid from the lower end of the second column after the liquid has passed through the bed of the second column in the downward direction;
f. periodically backwashing each of the columns after liquid has been treated in the columns;
g. detecting the occurrence of a breakthrough with respect to the effluent liquid of the second column;
h. removing the bed of activated carbon of only the first series-connected column from the treatment process after breakthrough is detected;
i. providing a bed of fresh activated carbon in a column; thereafter, passing the influent liquid to the lower end of the second column and forcing the liquid to pass upwardly through the bed of activated carbon contained in the second column;
j. passing the liquid from the upper end of the second column to the upper end of the column having fresh activated carbon; and
k. receiving the effluent liquid from the lower end of the column containing the fresh activated carbon after the liquid has passed through the bed of this material in a downward direction.

3. A process for purifying liquid by passing through granular solid beds of activated carbon comprising the steps of:

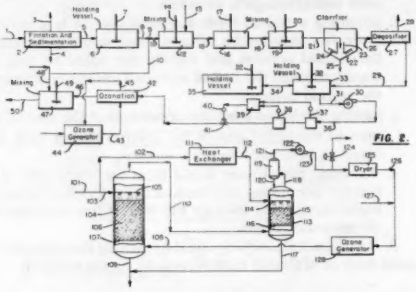


a. providing at least first and second series-connected columns, each containing a bed of granular solid, activated carbon;
b. passing influent to the lower end of the first column;
c. forcing the liquid to percolate upwardly through the bed of activated carbon contained in the first column;
d. passing the liquid from the upper end of the first column to the upper end of the second column;
e. percolating the liquid in a downward direction through the bed of activated carbon contained in the second column;
f. periodically backwashing each of the columns after liquid has been treated in the columns;
g. detecting the occurrence of a breakthrough with respect to the effluent liquid of the last-downstream series-connected column;
h. removing the bed of activated carbon of only the first column from the purification process after breakthrough is detected;
i. providing a bed of fresh granular solid activated carbon in a column;
j. thereafter, passing the influent liquid to the lower end of the second column and forcing the liquid to pass upwardly through the bed of activated carbon contained in the second column; and
k. percolating the liquid through the bed of fresh activated carbon as the last downstream, series-connected column.

3,855,124
PROCESS AND APPARATUS FOR THE PURIFICATION OF AN AQUEOUS WASTE STREAM FROM A SILICONE-OLYMER PRODUCING PLANT

Heine Lapidot, Latham, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Nov. 22, 1971, Ser. No. 200,704
Int. Cl. B01d *21/10*; C02c *1/28*
U.S. Cl. 210—44 20 Claims



1. Process for the purification of aqueous waste material from a silicone-polymer producing plant which comprises:

A. conducting an aqueous waste stream to a flotation and sedimentation zone, wherein water-insoluble materials of densities lower than water are removed from said waste stream as the upper layer in said zone, and wherein water-insoluble materials with densities higher than water are removed from the waste stream as the bottoms from said zone;

B. removing said aqueous waste stream from said flotation and sedimentation zone and adjusting the pH of said aqueous waste stream to a value of at least about 12;

C. conducting said waste stream to a clarification zone wherein solid material having a density greater than water is removed from the aqueous waste stream as bottoms from the clarification zone;

D. removing said aqueous waste stream from said clarification zone and conducting said stream having a pH of at least about 12 to an ozonation zone at a controlled rate so as to achieve a predetermined amount of C.O.D. of organics per unit time entering said ozonation zone;

E. conducting said aqueous waste stream to at least one holding zone prior to the ozonation zone and subsequent to the flotation and sedimentation zone;

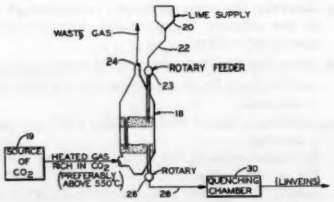
F. removing said aqueous waste stream from said at least one holding zone at said controlled rate; and

G. obtaining a purified aqueous waste stream.

3,855,125
IMPROVED PROCESS FOR TREATING WATER AND WASTEWATER

Ping-Wha Lin, 506 S. Darling, Angola, Ind. 46702

Filed Nov. 9, 1972, Ser. No. 305,148
Int. Cl. C02b *1/30*
U.S. Cl. 210—46 6 Claims

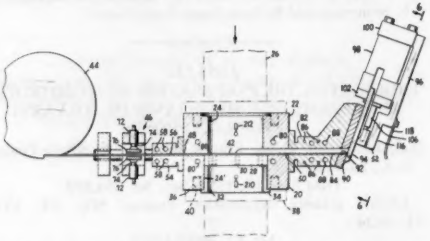


1. A process for neutralizing acids in industrial wastes and to remove contaminants such as phosphates, acids and turbidity in wastewater, comprising the steps of mixing with the wastewater a material consisting of a core of lime having a shell of distinctly cracked calcium salt derived by heating such material to a temperature above 600°C for a period of two to forty minutes and suddenly quenching such material by cooling to room temperature to induce thermal fracture so that said distinctly cracked calcium shell is characterized as having access channels to said core and said shell being selected from the group consisting of calcium sulphate and calcium carbonate, and collecting and separating sludge formed as a by-product of reaction between the lime core and the said contaminants to effect substantially contamination free water.

3,855,126
CONTINUOUS INCREMENTAL FEED FILTRATION PROCESS AND APPARATUS

Graydon Smith, 57 Lexington Rd., Concord, Mass. 01742

Filed Aug. 14, 1972, Ser. No. 280,680
Int. Cl. B01d *33/04*
U.S. Cl. 210—77 14 Claims



1. An apparatus to filter contaminants from a heat-softened material comprising,

a housing,

said housing including a passage therethrough through which said heat-softened material is forced to flow,

said housing provided with opposed inlet and outlet ports flanking said passage,

a filtering medium comprising a filter screen in the form of a band of substantial length,

said filter band being disposed through said inlet and outlet ports across said passage whereby said material flowing through said passage is forced to flow through said filter screen thereby to filter out contaminants from said material,

means cooperably disposed near said inlet port to selectively grip and advance a predetermined length of said filter band into said housing to introduce a fresh section of said filter screen within said passage,

said means to grip and advance said filter band into said housing including means to positively seal said inlet port after said filter band has been advanced to preclude leakage of said material from said apparatus, and

means to positively seal said outlet port after said filter band has been advanced to preclude leakage of said material from said apparatus.

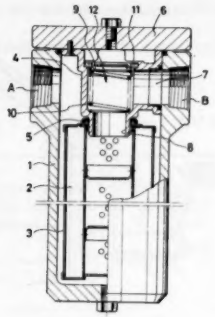
3,855,127
FILTER CASE ASSEMBLY

Tethuo Nakajima, 7-7, Nishikoiwa 3-chome, and Yoshihisa Maeda, 10-14 Umeda 2-chome, both of Tokyo, Japan

Filed Oct. 24, 1972, Ser. No. 300,371
Int. Cl. B01d *35/00*
U.S. Cl. 210—90 2 Claims

1. A filter case assembly, comprising a filter housing having an open top and a side wall with an opening on one side and a discharge opening on the opposite side, a hollow cylindrical filter disposed in said housing between said inlet opening and said discharge opening, a cover closing the top of said housing and a valve body carried by said cover having a substantially central cylindrical body portion at least as wide as said inlet

opening and disposed in the flow path between said inlet and outlet openings and forming a buffer against the working pressure flow from said inlet to said outlet, said body having a first hollow tubular portion extending in the direction of flow from said inlet to said outlet from said cylindrical body to said outlet and a second tubular portion extending from said cylindrical body downwardly into the bore of said hollow cylindrical filter, said filter housing having a valve in the flow passage between said first and second tubular portions with a valve



seat in said flow passage, a relief valve movable over said seat and, spring means biasing said relief valve in a predetermined direction in respect to said seat, said cover being reversible along with said cylindrical body and said first and second tubular members in order to connect said first tubular member from said cylindrical valve body to said inlet with the connection of said second tubular portion remaining in the bore of said hollow cylindrical filter whereby to change the flow direction through said filter case assembly.

3,855,128

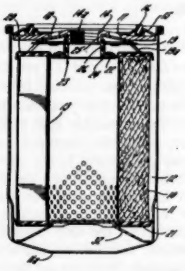
FLUID FILTER BYPASS VALVE

Gregory P. Shaltz, and Carl G. VanLoo, both of Longmont, Colo., assignors to Gould, Inc., Mendota Height, Minn.

Filed Apr. 13, 1973, Ser. No. 350,705

Int. Cl. B01d *27/10*

U.S. Cl. 210—130 **5 Claims**



1. A fluid filter comprising the combination of an annular filter element, fluid communication means operatively associated with said filter element and including inlet means for conducting fluid to one side of said filter element and outlet means for conducting fluid away from the opposite side of said filter element, an annular end cap attached to one end of said filter element and preventing the entry of fluid into said filter element through said one end thereof, said end cap forming a fluid passageway extending directly from said inlet means to said outlet means so as to bypass said filter element, a screw plate fastened adjacent said end cap and forming an inturned axial flange that is internally threaded for mounting the filter, said end cap forming an axial flange on the inner periphery thereof and telescoped over the inturned axial flange of said screw plate, and a single unitary valve element fitted tightly between the telescoped axial flanges of said end cap and said screw plate to form a fluid seal between the inner periphery of said end cap and the flange of said screw plate, said valve element including a resilient free end portion overlapping said fluid passageway and normally biased against said end cap to close said passageway, said resilient end portion being free for flexing movement away from said end cap in response to a predetermined increase in the fluid pressure in said inlet means so as to open said fluid passageway to permit fluid to flow therethrough and bypass said filter element.

3,855,129

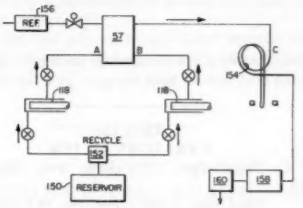
NOVEL PUMPING APPARATUS

Louis Abrahams, Worcester; Burleigh M. Hutchins, Jr., and James L. Waters, both of Framingham, all of Mass., assignors to Waters Associates, Inc., Framingham, Mass.

Filed Mar. 6, 1972, Ser. No. 232,128

Int. Cl. B01d *15/08*; **G01n** *31/08*

U.S. Cl. 210—198 C **31 Claims**



1. In a chromatography system of the type comprising (A) a liquid delivery system comprising a pump and discharge port for supplying liquid under pressure to (B) a compartment containing a stationary phase forming means to interact with said liquid phase to effect a separation thereof during its passage through said compartment, and (C) means to collect the liquid phase leaving the compartment, the improvement wherein said liquid delivery system comprises

1. interposed between said pump and said compartment, a liquid pressure-sensing means, and
2. motor control means operably communicating between said pressure-sensing means and a motor drive means for said pump, said motor control means forming means to control the flow-output of said pump by controlling said motor in response to the pressure-sensed by said pressure-sensing means.

3,855,130

COLUMN FOR PRESSURE CHROMATOGRAPHY

Dieter Randau, Itzehoe, and Wolfram Schnell, Darmstadt, both of Germany, assignors to Merck Patent Gesellschaft mit beschranker Haftung, Darmstadt, Germany

Filed Dec. 6, 1972, Ser. No. 312,726

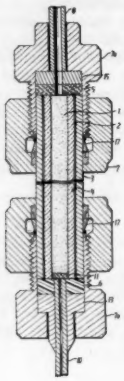
Claims priority, application Germany, Dec. 7, 1971, 7146039

Int. Cl. B01d *15/08*

U.S. Cl. 210—198 C **5 Claims**

1. Column for liquid pressure chromatography comprising a single inner glass pipe, adapted to be filled with adsorbent, fitted within a single outer steel pipe with a narrow interspace between the inner wall of the steel pipe and the outer wall of the glass pipe, which interspace is sealed at the outlet end of the column, with a gasket formed from a substantially nonporous inert resilient plastic which is press fitted against the outlet end of both the glass pipe and the steel pipe, and is in

restricted fluid communication with the interior of the glass pipe at the inlet end of the column, said fluid communication

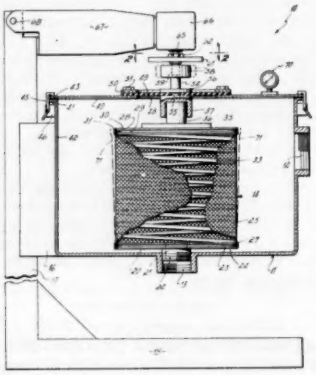


being provided by a porous annular packing ring press fitted against the inlet ends of both the glass pipe and the steel pipe.

3,855,131
GYRATORY FILTER

Harold C. Thumberger, 1031 Belle Ave., Hamilton, Ohio 45015

Filed June 5, 1973, Ser. No. 367,166
Int. Cl. B01d *33/00*
U.S. Cl. 210—383 **7 Claims**

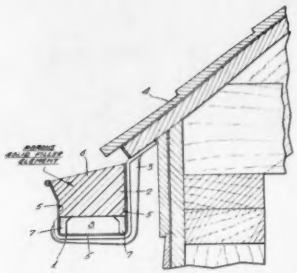


1. Filtering apparatus comprising
a closed container having an inlet and an outlet
a filter mounted in said container between said inlet and outlet and comprising
a bottom plate fixed to said outlet and having a hole communicating with said outlet
a top plate
a helical spring mounted between said top and bottom plates,
a screen surrounding said spring and secured to said top and bottom plates,
and means for moving said top plate through a substantially horizontal orbital path of movement as fluid passes from said inlet to said outlet.

3,855,132
OPEN TROUGH FILLER

William P. Dugan, Media, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation of Ser. No. 387,398, Aug. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 275,679, July, 1972, abandoned. This application Apr. 30, 1974, Ser. No. 465,468
Int. Cl. B01d *35/02*
U.S. Cl. 210—455 **9 Claims**



1. A rain gutter in combination with a roof comprising an upper inlet and a lower outlet through which a liquid passes, and a filler element made of a reticulated porous solid material positioned within the volume defined by the interior walls of said rain gutter whereby liquid may enter said inlet and flow through said filler and said outlet and foreign debris will be trapped on the surface of said filler.

3,855,133
MULTI-LAYER FILTER MEMBRANE

Karl Gustav Roehsler, Goettingen-Nikolausberg, Germany, assignor to Sartorius-Membranfilter GmbH, Gottingen, Germany

Filed Dec. 20, 1972, Ser. No. 316,649
Claims priority, application Germany, Dec. 28, 1971, 2165073
Int. Cl. B01d *25/16*
U.S. Cl. 210—490 **35 Claims**

1. A multiple layer filter membrane comprising:
a. an osmotic skin composed of at least one closed continuous film about 0.05 to about 0.1 μm thick of a selectively permeable high polymer selected from the group consisting of an inelastic selectively permeable high polymer, an elastic selectively permeable high polymer and an elastified selectively permeable high polymer; and
b. a porous base containing finely divided filler material therein, the base composed of a gel film which swells in contact with and is insoluble in water, the gel layer backed by a relatively thicker cellulose acetate sponge layer impregnated on the side remote from both the gel layer and osmotic skin (a) having a pore size which increases continuously from the gel through out the sponge layer to the back thereof.

3,855,134
INTUMESCENT COMPOSITION

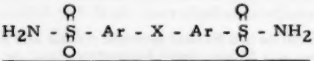
Joseph Green, East Brunswick, and Shirley H. Roth, Highland Park, both of N.J., assignors to Cities Service Company, New York, N.Y.

Filed Apr. 17, 1972, Ser. No. 244,959
Int. Cl. C09d *5/18*
U.S. Cl. 252—8.1 **12 Claims**

1. A non-flaming intumescent composition consisting essentially of:

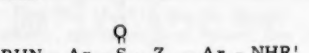
A. a normally self-extinguishing intumescent agent selected from the group consisting of:

1. self-extinguishing compounds corresponding to the formula:

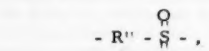


wherein Ar is a divalent aromatic residue and X is a divalent functional group,

2. self-extinguishing compounds corresponding to the formula:



wherein Ar is a divalent aromatic residue; R and R′ are hydrogen or a hydrocarbon, halohydrocarbon, or acyl radical; Z is — O —, — S — , or

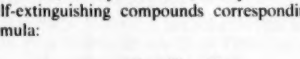


in which R″ is an alkylene radical containing 1–5 carbon atoms; and n is 0 or 1,

3. self-extinguishing compounds corresponding to the formula:

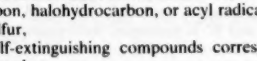
wherein Ar is a divalent aromatic residue and R is hydrogen or a hydrocarbon, halohydrocarbon, or acyl radical,

4. self-extinguishing compounds corresponding to the formula:



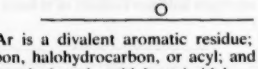
wherein Ar is a divalent aromatic residue, R is hydrogen or a hydrocarbon, halohydrocarbon, or acyl radical, and X is oxygen or sulfur,

5. self-extinguishing compounds corresponding to the formula:



wherein Ar is a divalent aromatic residue; R is hydrogen, hydrocarbon, halohydrocarbon, or acyl; and R″ is a substituted or unsubstituted pyridyl, pyrimidyl, pyridazyl, pyrazyl, pyrazolyl, imidazolyl, thiadiazolyl, oxadiazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, or aromatic hydrocarbon radical, and

6. self-extinguishing compounds corresponding to the formula:



wherein Ar is a divalent aromatic residue, R is a substituted or unsubstituted pyridyl, pyrimidyl, pyrazyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, or triazolyl radical, and R′ is hydrogen, hydrocarbon, substituted hydrocarbon, or acyl and

B. about 0.5–250%, based on the weight of the intumescent agent, of a haloorganophosphorus compound.

3,855,135

MIST LUBRICANT

Thomas D. Newingham, Broomall; James R. Amaroso, Newton Square; Walter J. Coppock, Wallingford, all of Pa., and Edward S. Williams, Claymont, Del., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. Nos. 140,398, May 5, 1971, , and Ser. No. 178,193, Sept. 7, 1971,. This application Apr. 24, 1972, Ser. No. 246,997

Int. Cl. C10m *1/28, 1/18, 9/00*

U.S. Cl. 252—15 **7 Claims**

1. A process of lubrication which comprises:

a. converting into an aerosol a mixture of a mineral lubricating oil having an SUS viscosity in the range of 100 to 3000 at 100°F. with an effective amount of a polymeric additive selected from a polystyrene and a polystyrene in admixture with a member of the group consisting of polyacrylates and polybutenes, said polymeric additive having a viscosity average molecular weight in the range of 10,000 to 2,000,000 and said effective amoung being in the range of 0.01 to 2 weight percent as based on said mineral lubricating oil and sufficient to reduce the stray fogging and permit adequate reclassification of said mineral lubricating oil,

b. pneumatically conducting said aerosol to a zone where lubrication occurs, and

c. reclassifying said aerosol in said zone whereby the oil droplets of the aerosol are coalesced within said lubrication zone.

3,855,136

DISPERSION FOR HOT ROLLING ALUMINUM PRODUCTS

Ewell E. McDole, Danville, Calif., and Frank L. Howard, Bountiful, Utah, assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 198,898, Nov. 15, 1971, Pat. No. 3,770,636. This application Sept. 13, 1973, Ser. No. 396,813

Int. Cl. C10m *1/22*

U.S. Cl. 252—49.5 **13 Claims**

1. A nonstaining neat oil composition for hot rolling aluminum products suitable for dispersion in water consisting essentially of about 5 to 50% by weight of at least one fatty alcohol selected from the group consisting of monohydric, saturated primary fatty alcohols having from 8 to 20 carbon atoms, about 20 to 60% by weight polybutene having an average molecular weight greater than about 500 and a viscosity from about 2400 to about 10,000 SSU at 100°F, and about 20 to 75% by weight of an additional hydrocarbon lubricating oil having a distillation range from about 500° to 725°F at one atmosphere, which distillation range is below that of the polybutene wherein at least 90% of said hydrocarbon oil is distilled within said temperature range.

3,855,137

HYDROCARBON GELS

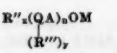
Thomas A. Whitney, Roselle, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 231,746, March 3, 1972, Pat. No. 3,775,069. This application Aug. 9, 1973, Ser. No. 386,950

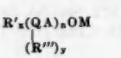
Int. Cl. H01f *1/28*

U.S. Cl. 252—62.52 **3 Claims**

1. A magnetic composition of matter comprising a gelatinous hydrocarbon containing an amount ranging from ¾ to 5 % by weight of said hydrocarbon, of a compound having either the formula MOR or



in combination with a compound having the formula $M'(OR')_3$ in a molar ratio ranging from 3:1 to 1:3 equivalents of either MOR or



to $M'(OR')_3$, wherein M is one selected from the group consisting of Group IA metals; M' is one selected from the group consisting of Group IIIA metals; R and R' are independently selected from the group consisting of C_1–C_{25} straight or branched hydrocarbyl radicals; R'' and R''' are the same or different wherein each is a C_1–C_{10} straight or branched hydrocarbyl radical; Q is O or N; A is a hydrocarbyl group containing from 2 to 4 methylenic carbon atoms having 0 to 2 substituents, said substituents being one selected from the group consisting of C_1–C_6 cycloalkyl, phenyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, Cl, Br, I; *n* is an integer ranging from 1 to 10 inclusive; *x* is an integer and is either 1 or 2 depending on the valence of Q; *y* is either 0 or 1 depending on the valence of Q; in combination with an iron powder or other ferromagnetic material to provide the composition with magnetic properties.

3,855,138

INTUMESCENT COMPOSITION

Shirley H. Roth, Highland Park, N.J., assignor to Cities Service Company, New York, N.Y.

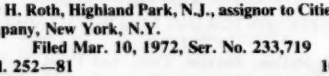
Filed Mar. 10, 1972, Ser. No. 233,719

U.S. Cl. 252—81 **10 Claims**

1. A non-flaming intumescent composition consisting essentially of:

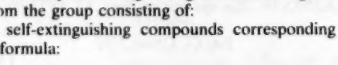
A. a normally self-extinguishing intumescent agent selected from the group consisting of:

1. self-extinguishing compounds corresponding to the formula:

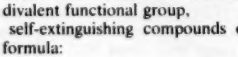


wherein Ar is a divalent aromatic residue and X is a divalent functional group,

2. self-extinguishing compounds corresponding to the formula:

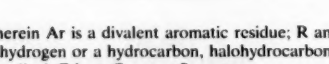


wherein Ar is a divalent aromatic residue; R and R' are hydrogen or a hydrocarbon, halohydrocarbon, or acyl radical; Z is —O—, —S—, or



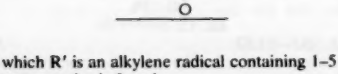
in which R' is an alkylene radical containing 1–5 carbon atoms; and *n* is 0 or 1,

3. self-extinguishing compounds corresponding to the formula:



wherein Ar is a divalent aromatic residue and R is hydrogen or a hydrocarbon, halohydrocarbon, or acyl radical,

4. self-extinguishing compounds corresponding to the formula:



wherein Ar is a divalent aromatic residue, R is hydrogen or a hydrocarbon, halohydrocarbon, or acyl radical, and X is oxygen or sulfur,

5. self-extinguishing compounds corresponding to the formula:

wherein Ar is a divalent aromatic residue; R is hydrogen, hydrocarbon, halohydrocarbon, or acyl; and R'' is a substituted or unsubstituted pyridyl, pyrimidyl, pyridazyl, pyrazyl, pyrazolyl, imidazolyl, thiadiazolyl, oxadiazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, or aromatic hydrocarbon radical, and

6. self-extinguishing compounds corresponding to the formula:

wherein Ar is a divalent aromatic residue, R is a substituted or unsubstituted pyridyl, pyrimidyl, pyrazyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, or triazolyl radical, and R' is hydrogen, hydrocarbon, substituted hydrocarbon, or acyl and

B. about 0.5–250%, based on the weight of the intumescent agent, of a nitrogen compound selected from the group consisting of amines, imines, amides, and imides having a nitrogen content of at least about 30% by weight or a combined nitrogen-halogen content of at least about 30% by weight.

3,855,139

MACHINE DISHWASHING FORMULATIONS CONTAINING A METAL TETRACARBOXYLATE

Robert P. Langguth, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 4, 1972, Ser. No. 312,238

Int. Cl. C11d 7/56

U.S. Cl. 252—99 **7 Claims**

1. A machine dishwashing formulation comprising

a. from 0.5 to 5% by weight of a surfactant selected from the group consisting of low-foaming anionic and nonionic surfactants and mixtures thereof,

b. an active chlorine providing material selected from the group consisting of potassium dichlorocyanurate; sodium dichlorocyanurate; [(mono-trichloro) tetra-(monopotassium dichloro)] penta-isocyanurate; (mono-trichloro) (mono-potassium dichloro) di-iso-cyanurate;

and chlorinated trisodium phosphate, said active chlorine providing material constituting from 10 to 30% by weight of the formulation when said material is chlorinated trisodium phosphate and from 0.5 to 5% by weight of the formulation when said material is a chlorocyanurate, and c. from 20% to 90% of a tetra alkali metal ethane-1,1,2,2-tetracarboxylate.

3,855,140

CLEANSING COMPOSITIONS

Michael Royston Billany; Arthur Raymond Longworth, and John Shatwell, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed May 15, 1972, Ser. No. 253,102

Claims priority, application Great Britain, June 18, 1971, 28764/71

Int. Cl. C11d *1/72, 3/48*

U.S. Cl. 252—106 **6 Claims**

1. A skin-cleansing composition which consists essentially of from 0.5 to 10.0 percent w/v of a salt of chlorhexidine which is soluble to the extent of at least 0.5 percent w/v in water at ambient temperature, selected from the group consisting of the gluconate, isethionate, formate, acetate, glutamate, succinamate, mono-diglycollate, di-methanesulphonate, lactate, di-isobutyrate and glucoheptonate salt, a polyoxyethylene-polyoxypropylene block copolymer of the formula

$$HO-(CH_2CH_2O)_a\left(\begin{matrix}CH\cdot CH_2O\\ |\\ CH_3\end{matrix}\right)_b(CH_2CH_2O)_cH$$

wherein *a*, *b* and *c* are integers, such that said copolymer consists of 70 percent of polyoxyethylene and wherein the molecular weight of the polyoxypropylene content is about 2250, and water.

3,855,141

METHOD OF PROCESSING A SPENT COPPER ETCHING SOLUTION FOR REUSE IN AN ELECTROLESS COPPER RECOVERY BATHS

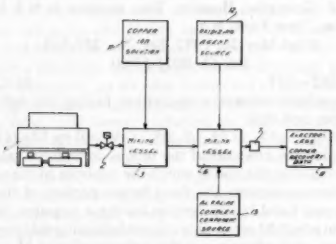
Claus Werner Ruff, Lichtenfels, Germany, assignor to Loewe-Opta GmbH, Berlin, Germany

Filed Aug. 22, 1973, Ser. No. 390,553

Claims priority, application Germany, Sept. 9, 1972, 2244307

Int. Cl. C09k *3/00;* **C23b** *3/00*

U.S. Cl. 252—79.2 **4 Claims**



1. For use in the recovery of copper that is etched with the use of an acidic solution containing $CuCl_2$ wherein a portion of the $CuCl_2$ is converted into CuCl during such etching operation as the solution becomes spent, a method of preparing the spent etching solution for reuse in the separation of the etched copper by electroless means which comprises the steps of:

adding copper ions to the spent solution to a predetermined copper concentration suitable for electroless copper separation; and thereafter adding to the enriched solution an oxidizing agent and an alkaline complex component in amounts respectively effective to (1) oxidize the added copper to increase the concentration of $CuCl_2$ in the solution and correspondingly decrease the concentration of CuCl, and (2) to convert the etching solution into an alkaline bath.

3,855,142

ENZYMATIC DENTURE CLEANSER

Morton Pader, Teaneck, and Carl G. Richberg, Cresskill, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 163,103, July 15, 1971, abandoned. This application Sept. 14, 1973, Ser. No. 397,534

Int. Cl. C11d *3/06*

U.S. Cl. 252—135 **16 Claims**

1. A denture cleanser composition comprising a lipolytic enzyme at a concentration to provide lipolytic activity of about 20 to about 50,000 lipase units in 100 ml of a solution of said composition, admixed with a buffering agent, said buffering agent being capable of providing a pH of about 4.5 to about 10 and being inert with respect to the lipolytic action of the enzyme.

3,855,143

LUMINESCENT LITHIUM SILICATE ACTIVATED WITH TRIVALENT CERIUM

Roelof Egbert Schuil, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 14, 1972, Ser. No. 271,833

Claims priority, application Netherlands, July 24, 1971, 7110248

Int. Cl. C09k *1/54*

U.S. Cl. 252—301.4 F **3 Claims**

1. A luminescent silicate having the olivine crystal structure, said silicate being activated by trivalent cerium and having the formula $Li_{1-x}Na_xY_{1-p}Ce_pSiO_4$ wherein $0.50 \leq x \leq 0.80$ and $0.0001 \leq p \leq 0.25$.

3,855,144

LUMINESCENT DEVICE, PROCESS, COMPOSITION, AND ARTICLE

Stephen W. Barber, Toledo, Ohio, and William F. Nelson, Port Washington, N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 41,455, May 28, 1970, Pat. No. 3,634,711, which is a division of Ser. No. 841,690, July 1, 1970, Pat. No. 3,527,711, which is a continuation-in-part of Ser. Nos. 355,248, March 27, 1964, , and Ser. No. 355,251, March 27, 1964, , and Ser. No. 355,253, March 27, 1964, , and Ser. No. 355,407, March 27, 1964, , and Ser. No. 355,408, March 27, 1964, , and Ser. No. 355,409, March 27, 1964, , and Ser. No. 355,421, March 27, 1964, , and Ser. No. 355,422, March 27, 1964, , and Ser. No. 355,444, March 27, 1964, , and Ser. No. 355,445, March 27, 1964, , and Ser. No. 355,469, March 27, 1964, , and Ser. No. 355,470, March 27, 1964, , and Ser. No. 355,471, March 27, 1964, , said Ser. No. 841,690, is a continuation of Ser. No. 641,264, May 25, 1967, , which is a continuation-in-part of Ser. No. 355,248, , , and Ser. No. 355,251, , , and Ser. No. 355,253, , , and Ser. No. 355,407, , , and Ser. No. 355,408, , , and Ser. No. 355,409, , , and Ser. No. 355,421, , , and Ser. No. 355,422, , , and Ser. No. 355,444, , , and Ser. No. 355,445, , , and Ser. No. 355,469, , , and Ser. No. 355,470, , , and Ser. No. 355,471, ,. This application Nov. 30, 1971, Ser. No. 203,495

Int. Cl. C09k *1/10;* **C09k** *1/54;* **C03c** *3/28*

U.S. Cl. 252—301.4 F **3 Claims**

1. A substantially transparent, homogeneous luminescent glass consisting essentially of silica and oxides of the rare earths europium and terbium wherein the total number of such rare earth atoms per million silicon atoms is from 10 to 5,000, and the number of each of said rare earth atoms per million silicon atoms is at least five, said silica glass, exclusive

of said rare earth oxides, being at least 99 weight percent silica.

3,855,145

PREPARATION OF CONCENTRATED SILICA ORGANOSOLS

Peter H. Vossos, Lisle, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Continuation-in-part of Ser. No. 110,582, Jan. 28, 1971, abandoned. This application Oct. 31, 1972, Ser. No. 302,631

Int. Cl. B01j *13/00*

U.S. Cl. 252—309 **5 Claims**

1. A method of preparing a concentrated silica organosol which comprises the steps of:

A. passing a silica sol containing 20–60 percent colloidal particles of amorphous silica through a cation exchange resin in the hydrogen form and a strong base anion exchange resin in the hydroxide form to produce a single deionized sol and after a holding time of 12–24 hours passing said single deionized sol through a cation exchange resin and an anion exchange resin to produce a double deionized silica sol having a SiO_2 content of from 50 to 70 percent by weight;

B. adding said double deionized silica sol to a reaction vessel containing a water-miscible organic alcohol; feeding additional water-miscible organic alcohol as a water alcohol azeotrope is removed by vacuum

distillation at a temperature below about 100° C; and recovering the silica organosol product.

3,855,146

PROCESS FOR PREPARING MICROSCOPIC CAPSULES CONTAINING HYDROPHOBIC OIL DROPLETS THEREIN

Keiso Saeki, and Hiroharu Matsukawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 29, 1972, Ser. No. 230,465

Claims priority, application Japan, Mar. 3, 1971, 46-11077; Mar. 12, 1971, 46-13361; Apr. 28, 1971, 46-28383

Int. Cl. B01j *13/02;* **B44d** *1/44*

U.S. Cl. 252—316 **19 Claims**

1. In a process for preparing microscopic capsules containing hydrophobic oil droplets therein comprising

1. emulsifying a water-immiscible oil in an aqueous solution of at least one hydrophilic colloid which is ionizable in water to obtain a first sol, and then mixing said first sol with an aqueous solution of a hydrophilic colloid which is ionizable in water and has an electric charge opposite that of said first sol, one of said sols being positively charged, or emulsifying a water-immiscible oil in an aqueous solution of hydrophilic colloids which are ionizable in water and at least one of which is positively charged, one of the hydrophilic colloids being relatively negatively charged,

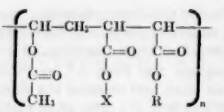
2. adding water thereto, adjusting pH thereof, or adding water thereto and adjusting the pH thereof, to obtain coacervates wherein complex colloids are deposited around individual oil droplets,

3. cooling to gel the resulting coacervates,

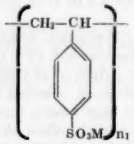
4. adjusting the pH thereof to from 9 to 11, and

5. hardening said coacervate,

the improvement comprising adding prior to step (3) a compound selected from the group consisting of (a) a vinyl acetate-maleic acid copolymer and derivatives thereof having the following repeating units:



wherein R represents a hydrogen atom, an alkyl group or an alkali metal atom, and X represents a hydrogen atom or an alkali metal atom, except that when R is an alkyl group X is an alkali metal atom and n represents the degree of polymerization and ranges such that the average molecular weight of the copolymer is about 500 to about 500,000 (b) a polyvinyl benzene sulfonate having repeating units of the following general formula:



wherein M represents an alkali metal atom and wherein n_1 represents the degree of polymerization and ranges such that the average molecular weight of the copolymer is from about 1,000 to about 3,000,000, or a copolymer of vinylbenzene sulfonate and a member selected from the group consisting of acryloylmorpholine, morpholino alkyl acrylamide, acrylamide, vinyl-pyrrolidone and alkoxyalkyl acrylamide and (c) a copolymer of acrylic acid or methacrylic acid and a member selected from the group consisting of acryloyl morpholine, morpholino-alkyl acrylamide, acrylamide, vinyl-pyrrolidone and alkoxyalkyl acrylamide or the salts of said copolymers of acrylic or methacrylic acid,

said compound selected from among (a), (b) and (c) being present in an amount sufficient to induce coacervation without becoming a predominant part of the main wall membrane of said microcapsules to prepare microscopic capsules encapsulated with a thick wall membrane having a low degree of porosity.

3,855,147

SYNTHETIC SMECTITE COMPOSITIONS, THEIR PREPARATION, AND THEIR USE AS THICKENERS IN AQUEOUS SYSTEMS

William T. Granquist, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Filed May 26, 1972, Ser. No. 257,303

Int. Cl. B01j *13/00*

U.S. Cl. 252—317 **16 Claims**

1. A synthetic mineral composition having the following formula per unit cell:

$$\{[Mg_6Al_zSi_{8-z}O_{20}(OH_{4-n}F_n)\}^{z-} \cdot (xM^z/z)\} + y\ Mg\ (O,OH)$$

in which the contents of the braces constitutes said unit cell of a smectite and in which the contents of the square brackets represents the fixed lattice portion of the unit cell, said fixed lattice portion having a negative charge; and in which M represents cations balancing said negative charge, and wherein z is the valence of said M, and in which said M is selected from the group of cations consisting of alkali metal cations, alkaline earth metal cations, ammonium ions, and mixtures thereof; and in which y Mg (O,OH) is an accessory phase occluded with said smectite and consisting of hydrous magnesium oxide selected from the class consisting of magnesium oxide, magnesium hydroxide, hydrous magnesium oxide species intermediate therebetween, and mixtures thereof; and in which said x, said y, said z, and said a have values within the following ranges:

$0.1 \leq x \leq 1.5$
$0.1 \leq y \leq 2$
$0 \leq a \leq 2$
$1 \leq z \leq 2$.

3,855,148

SPRAYING AND SMOKE-LAYING APPARATUS

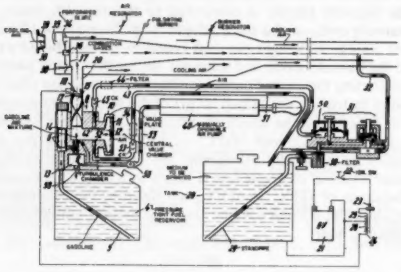
Otto Locher; Franz Haag, and Paul Bongartz, all of Isny, Germany, assignors to Heimo Geraetebau Gesellschaft mit beschrankter Haftung, Isny, Germany

Filed Apr. 25, 1972, Ser. No. 247,296

Claims priority, application Germany, Apr. 28, 1971, 2120749

Int. Cl. B01d ; B01f ; B01j *13/00*

U.S. Cl. 252—359 CG 16 Claims



1. In an apparatus for fuel comsumption and ejecting a flowable medium, as for spraying or smoke laying: a container for said medium, a pulsating burner having an intake end for admission of a combustible mixture and a discharge end, and a burner resonator having one end connected to the burner discharge end and the other end open to form a discharge orifice, conduit means leading from said medium container to said burner resonator to supply said medium thereto, an air resonator tube coaxial with and surrounding said burner and burner resonator and having an air inlet upstream of the intake end of said burner resonator and open at the other end to form a discharge orifice adjacent the discharge end of said burner resonator, an air inlet connected to said burner, valve forming means connected to the air inlet end of said air resonator tube, said burner including an end section forming a mixing passage leading substantially at right angles into said one end of said resonator, the length of said passage bearing a predetermined ratio to the length of said air resonator tube, said conduit means leading from said medium container to said burner resonator being connected to the latter near the discharge end thereof, said burner including a carburetor having a turbulence chamber spaced from the end of said mixing passage opposite the burner end of the passage, a fuel nozzle coaxial with the mixing passage and interposed between the mixing passage and turbulence chamber and spaced from the adjacent end of the mixing passage, a helical strip in the end of said end section, and a baffle plate at the downstream end of said strip defining an annular space with said mixing passage, said air inlet communicating with the space between said mixing passage and said nozzle, and ignition means on the downstream side of said baffle plate for igniting the fuel-air mixture in said passage.

3,855,149

METHOD OF INCREASING COLD WATER SOLUBILITY OF LOCUST BEAN GUM

Edward C. Bielskis, Chicago, Ill., assignor to C. J. Patterson Company, Kansas City, Mo.

Filed Nov. 13, 1972, Ser. No. 305,929

Int. Cl. B01f *3/12*; B01j *13/00*

U.S. Cl. 252—363.5 18 Claims

1. A method of increasing the water-solubility of locust bean gum comprising the steps of:

a. passing sugar free locust bean gum through a processing zone for a period of time from about 15 seconds to 3 minutes, sufficient water being provided in the gum to cause the moisture content thereof to be at least at a level of from about 10 to 65 parts by weight of water for each 100 parts by weight of dry gum;

b. applying high compressive and shear forces to said gum while in said zone;

c. increasing the temperature of the gum in said zone while said compressive and shear forces are applied thereto; and

d. extruding the gum from said zone, the temperature of the gum being increased sufficiently in said zone such that gum exits therefrom at a temperature of from 160° – 300° F.

3,855,150

STABILIZATION OF HYDROQUINONE SOLUTIONS WITH CITRIC ACID

Arthur P. Weris, III, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 46,521, June 15, 1970, abandoned. This application Mar. 26, 1973, Ser. No. 344,806

Int. Cl. C07c *49/74*; B01j *1/18*

U.S. Cl. 252—404 5 Claims

1. The method of stabilizing hydroquinone solutions comprising hydroquinone and a solvent therefor, said solvent being substantially free from impurities, against the formation of undesirable color and odor during storage which comprises adding to said solution from about 0.0025 percent to about 1 percent by weight of the solution of citric acid.

3,855,151

REACTIVATION OF SPENT CHROMIC FLUORIDE CATALYSTS

Wesley Gerald Schindel, Pennsville, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 24, 1973, Ser. No. 400,042

Int. Cl. B01j *11/02*

U.S. Cl. 252—415 10 Claims

1. A process for reactivating a spent chromic (Cr III) fluoride halogen-exchange catalyst comprising reacting the spent catalyst, at a temperature from about 300° to 500°C., with a chlorine-source selected from

i. a saturated organic compound containing 1 or 2 carbon atoms, from 2 to 6 chlorine atoms and no hydrogen atoms, capable of dissociation at reaction temperatures to produce chlorine, and

ii. a saturated organic compound containing 1 or 2 carbon atoms and from 2 to 6 chlorine atoms, not capable of dissociation at reaction temperatures to produce chlorine, and chlorine,

thereby converting at least a part of the chromic fluoride to chromic (Cr III) chloride.

3,855,152

PREPARATION OF PERLITE-ASPHALT-FIBER COMPOSITIONS FOR SEPARATING HYDROCARBONS FROM WATER

Paul Preus, Toms River, N.J. 08753

Division of Ser. No. 83,640, Oct. 24, 1970, abandoned. This application Sept. 28, 1972, Ser. No. 292,886
Int. Cl. B01j *11/32*
U.S. Cl. 252—430 2 Claims

1. The process of producing an oleophilic-hydrophobic-lighter than water composition for the separation of water immiscible organic liquid from water produced by:

forming an aqueous mix of a major proportion of expanded perlite, asphalt, and fibrous material to produce a coherent member;

removing the moisture from said member;

comminuting the demoisturized member to produce a loose mass of particles having an average particle size with one dimension of at least about 1/8 inch in length, whereby said mass, when introduced into an organic liquid-water system, selectively absorbs the organic liquid from the water and remains buoyant.

3,855,153

UNSUPPORTED CATALYST FOR THE OXIDATION OF METHANOL TO FORMALDEHYDE

Gerald M. Chang, Orting, Wash., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

Filed July 26, 1973, Ser. No. 383,037
Int. Cl. B01j *11/22*
U.S. Cl. 252—470 6 Claims

1. In a method for producing an oxidation catalyst for the production of formaldehyde from methanol comprising:

I. forming an iron oxide-molybdenum oxide catalyst precursor by reacting a water soluble iron salt having a pH of between 1.5 and 2.1 with water soluble molybdate salt having a pH of between 2.25 and 5 to form a precipitate having a molar ratio of MoO_3 to Fe_2O_3 of from about 3.3:1 to 11.2:1 and

II. recovering the precipitate and

III. dehydrating the precipitate to a moisture content of from about 5 percent to about 30 percent by weight, followed by

IV. comminuting the precipitate and continued dehydrating to a moisture content of from about 2 percent to about 25 percent by weight, and

V. activating the comminuted precipitate prior to contact with methanol by placing the precipitate in a formaldehyde converter or a suitable oven and passing a mild stream of air through the converter or an oven while the temperature is raised to from about 300° to about 495°C and maintained until substantially all traces of moisture and gasifiable matter are removed; the improvement consisting of the following steps: (A) prior to activating, the dehydrated comminuted precipitate is ground to particle size ranging from about 0.033 inches to about 0.007 inches and then (B) balling the finely ground particles into spherical agglomerates while (C) simultaneously applying to the spherical agglomerates while they are forming a mixture of ammonium heptamolybdate and a cobalt containing compound selected from the group consisting of metallic cobalt, cobalt oxide, cobalt salts and ammonium 6-molybdocobaltate (III) so that the final balled catalyst precursor contains from 0.001 percent to about 0.20 percent cobalt by weight, and from 0.01 percent to about 2 percent ammonium molybdate by weight, and (D) dehydrating the spherical agglomerates to a moisture content of about 2 percent to about 10 percent by weight.

3,855,154

CATALYST FOR CONVERSION OF NON-CYCLIC C_3-C_5 ALKANES TO AROMATIC HYDROCARBONS

Maurice M. Mitchell, Jr., Wallingford, Pa., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Jan. 18, 1973, Ser. No. 324,720
Int. Cl. B01j *11/06, 11/32*
U.S. Cl. 252—456 4 Claims

1. A method for the production of supported bismuth oxide dehydrodimerization particles of from 20 to 50 mesh size and having substantially the same density as particles of a chromia-alumina catalyst containing from 10 to 25 mole per cent chromia in the same size range for use in a non-segregating admixture with said chromia-alumina particles at a weight ratio of supported bismuth oxide to chromia-alumina of about 1:1 for the conversion of non-cyclic C_3–C_5 alkanes to aromatic hydrocarbons of twice the number of carbon atoms as the alkane converted, which comprises dissolving bismuth nitrate in dilute nitric acid, contacting the resulting solution with silica gel particles in the 20 to 50 mesh range, U.S. Sieve, to deposit the bismuth nitrate on the silica gel surface, the ratio of bismuth nitrate to silica gel being adjusted such that after the bismuth nitrate is converted to the bismuth oxide, the bismuth oxide on the silica gel will range from about 12 weight per cent to 22 weight per cent based on the combined weight of the bismuth oxide and silica gel, drying the coated particles, contacting the coated particles with a dilute solution of ammonium hydroxide until the final pH of the wash solution is about 10, recovering the solids by filtration, drying the recovered solids at from about 100°C. to 150°C. calcining the dried solids by gradually increasing the calcination temperature over a period of about 6 to 8 hours to a final temperature in the range of 575°C. to 625°C. and finishing the calcination by holding the particles at the final calcination temperature for about 1 hour.

3,855,155

BARIUM PROMOTED IRON OXIDE CATALYST SUITED FOR USE IN STEAM-IRON PROCESS FOR PRODUCING HYDROGEN

Harlin D. Johnston, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 78,566, Oct. 6, 1970, Pat. No. 3,726,966. This application Jan. 24, 1973, Ser. No. 326,320
Int. Cl. B01j *11/22*
U.S. Cl. 252—473 9 Claims

1. A catalyst suitable for use in a steam-iron process for producing hydrogen consisting essentially of iron oxide promoted with a minor amount of barium intimately and uniformly distributed throughout the iron oxide, said catalyst having a surface area of at least about 1 square meter per gram and a pore volume of at least 0.5 ml/g in pores larger than about 200 A.

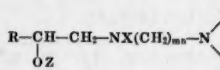
3,855,156

NEW DETERGENT COMPOSITION

Hideo Marumo, 5-4 Nishikubo, 3 Chome, Tokyo, Japan

Filed May 5, 1972, Ser. No. 250,653
Claims priority, application Japan, May 10, 1971, 46-30391; Jan. 26, 1972, 47-9019
Int. Cl. C11d *1/18, 3/26*
U.S. Cl. 252—547 8 Claims

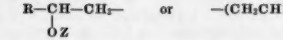
1. A detergent composition consisting essentially of at least one surface active agent of the formula:



wherein R is a hydrocarbon of 4 to 30 carbon atoms; Z is hydrogen or $-(CH_2CHR'O)_pH$,

wherein R' is hydrogen or methyl and *p* is an integer from 1 to 100;

X, Y and W are independently hydrogen,



wherein Z and P are as defined above;

m is an integer from 2 to 10;

n is an integer from 0 to 5;

and salts thereof.

3,855,157
CURABLE MIXTURES OF EPOXIDE RESINS AND PIPERIDINE DERIVATIVES

Helmut Zondler, Allschwil, Switzerland, and Wolfgang Pfleiderer, Konstanz, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

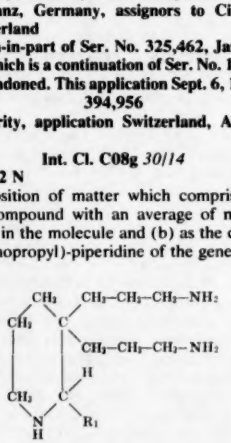
Continuation-in-part of Ser. No. 325,462, Jan. 22, 1973, abandoned, which is a continuation of Ser. No. 133,445, April 12, 1971, abandoned. This application Sept. 6, 1973, Ser. No. 394,956

Claims priority, application Switzerland, Apr. 13, 1970, 5452/70

Int. Cl. C08g *30/14*

U.S. Cl. 260—2 N **9 Claims**

1. A composition of matter which comprises (a) a 1,2-polyepoxide compound with an average of more than one epoxide group in the molecule and (b) as the curing agent, a 3,3-bis-(γ-aminopropyl)-piperidine of the general formula



(I)

wherein R_1 represents a hydrogen atom or a methyl group.

3,855,158
RESINOUS REACTION PRODUCTS

John P. Petrovich, and David L. Taylor, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1972, Ser. No. 318,820

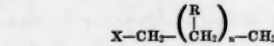
Int. Cl. C08g *33/06*

U.S. Cl. 260—2 BP **13 Claims**

1. A cationic resinous composition comprising the reaction product of

A. an adduct of

1. a dihaloalkane represented by the formula



wherein X represents chloro, bromo, or iodo, R is hydrogen, hydorxy or alkyl group having 1 to 4 carbon atoms, and *n* is 0 or 1 and

2. a polyalkylenepolyamine represented by the formula

$$H_2N(C_mH_{2m}NH)_pC_mH_{2m}NH_2$$

wherein *m* is an integer of from 4 to about 15 and *p* is 0 or 1 in a mole ratio of from about 0.5:1 to about 0.95:1 and

B. an epihalohydrin selected from the group consisting of epichlorohydrin, epibromohydrin, and epiiodohydrin,

in a mole ratio of from about 1.25 to about 2.5 moles of epihalohydrin per mole of amine group in said adduct.

3,855,159
POLYURETHANE FOAM SYSTEM

Donald H. Russell, Cherry Hill, N.J., assignor to Atlantic Richfield Company, Los Angeles, Calif.

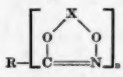
Filed June 7, 1973, Ser. No. 367,987

Int. Cl. C08d *13/08*

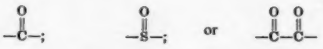
U.S. Cl. 260—2.5 AM **13 Claims**

1. A unitary polyurethane system comprised of two separately contained components which, when brought together, rapidly react without external heat to form polyurethane foam comprising:

1. A first component comprised of a cyclic nitrile compound having the structural formula



wherein X is



R is an organic radical containing 2 to 200,000 carbon atoms free from reactive hydrogens as determined by the Zerewitinoff test; and *n* is at least 2, and

2. A second component comprised of a first organic compound having at least 2 hydroxyl groups per molecule and a second organic compound having a total of at least 2 primary or secondary amine groups or mixtures of these per molecule, said first and second organic compounds each containing 2 to 100,000 carbon atoms and said cyclic nitrile carbonate and said first and second organic compounds being free of substituents which interfere with the desired reaction between the cyclic nitrile carbonate and said organic compounds.

3,855,160
THERMOSETTING FOAMABLE RESINOUS COMPOSITION

Tatsuzo Shiotsu, and Toshio Adachi, both of Osaka, Japan, assignors to Leben Utility Co., Ltd., Osaka-shi, Japan

Continuation of Ser. No. 192,892, Oct. 27, 1971, abandoned. This application June 12, 1973, Ser. No. 369,143

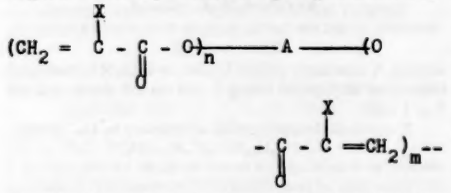
Claims priority, application Japan, Oct. 27, 1970, 45-93920

Int. Cl. C08g *53/10*

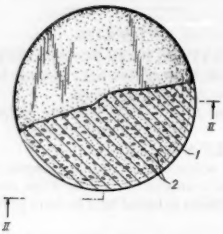
U.S. Cl. 260—2.5 N **11 Claims**

1. A thermosetting foamable resinous composition which consists essentially of (1) 5–70 percent by weight of a vinyl chloride resin having an average degree of polymerization of 500 to 2500 and a particle size of 0.05 – 50 microns, (2) 5–70 percent by weight of an unsaturated polyester resin having an average condensation degree of at least 4 and a number average molecular weight of 1,000 or more, (3) 2–60 percent by

weight of a reactive plasticizer having the general formula,



wherein A is a residue of a compound having at least two hydroxy group at molecule ends, or a compound having at least one ester or ether linkage in a molecule and at least two



terminal hydroxy groups; X stands for a hydrogen or halogen atom, or an alkyl group such as methyl and ethyl; and n and m are an integer of 1 to 3, (4) 0.02 – 3 percent by weight of a polymerization initiator, and 1 – 80 percent by weight of a bubbling material selected from the group consisting of; (a) hollow fine particles (b) microcapsules o resins and (c) fine particles of molecular sieve type adsorbents, said material containing a gas or a substance capable of releasing a gas at a temperature lower than the curing temperature of the composition.

3,855,161

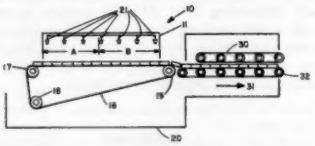
METHOD OF NEUTRALIZING A CATALYZED ALDEHYDE CONDENSATION RESIN FOAM

William H. Bauer, Medway, Mass., assignor to Filfast Corporation, Holliston, Mass.

Filed June 14, 1973, Ser. No. 369,809

Int. Cl. C08g *53/08*

U.S. Cl. 260—2.5 F **8 Claims**



1. A method of treating a self-supporting mass of an acid catalyzed urea-formaldehyde foam to increase the pH of the foam and remove unwanted materials therefrom,

said method comprising forming a foam mass with the use of an excess of acid catalyst,

allowing said foam mass to react to a self-supporting mass having a pH of from about pH 1 to pH 3,

and subjecting a surface of said foam mass to a hot aqueous liquid containing a treating material selected from the group consisting essentially of a cationic wetting agent and an anionic wetting agent, at a temperature of from about 120°F to about 212°F under conditions which permit said treating material containing liquid to enter cells of said mass and wash said mass to bring it to a pH of from about 6 to 8.

3,855,162

POLYMERIZATION OF VINYL CHLORIDE MONOMER IN THE PRESENCE OF SILICEOUS FILLERS

Jean-Pierre Durand, Chatou; Claude Fabre, Montrouge, and Maseh Osgan, Paris, all of France, assignors to Gerdec, Paris, France

Filed Apr. 20, 1973, Ser. No. 352,949

Claims priority, application France, Apr. 24, 1972, 72.14391

Int. Cl. C08f *45/04*

U.S. Cl. 260—17.4 SG **25 Claims**

1. In a process for producing reinforced polymers comprising the step of polymerizing vinyl chloride in the presence of a phyllosilicate filler and a polymerization, said polymerizing being either bulk polymerization, solvent polymerization, or precipitation polymerization in the presence of non-aqueous diluent,

the improvement wherein said polymerizing is conducted in a polymerization medium in the controlled presence of 1–20 percent by weight water based on the weight of the phyllosilicate filler the water content of the polymerization medium being adjusted by the addition of water thereto.

3,855,163

MALEINIZED FATTY ACID ESTERS OF 9-OXATETRACYCLO-4.4.1 O O UNDECAN-4-OL

George W. Bussell, Dearborn, Mich., assignor to Inmont Corporation, New York, N.Y.

Continuation of Ser. No. 339,289, March 8, 1973, abandoned, which is a division of Ser. No. 179,168, Sept. 9, 1971,. This application Mar. 4, 1974, Ser. No. 447,553

Int. Cl. C08g *30/00*

U.S. Cl. 260—18 EP **5 Claims**

1. A water-reducible resin useful for coating substrates by electrodeposition, said resin corresponding to the reaction product obtained by heating a mixture consisting of 15 to 20 percent maleic anhydride and 85 to 80 percent of a synthetic oil containing alicyclic rings comprised of the esterification product of one mole 9-oxatetracyclo-4.4·$1^{2,5}O^{1,6}O^{8,10}$ undecan-4-ol with three moles of unsaturated long chain fatty acid, said esterification product being prepared in the presence of an esterification catalyst, and said heating of the maleic anhydride and synthetic oil being at a temperature of 205 to 240°C. until substantially all of the maleic anhydride has reacted and the acid number is 50 to 90 based on non-volatiles.

3,855,164

STABILIZED POLYBUTADIENE COMPOSITIONS

Delmar F. Lohr, Jr., Bedford Heights, and Joseph A. Beckman, Franklin Township, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 25, 1972, Ser. No. 257,028

Int. Cl. C08c *11/72;* **C08d** *9/14*

U.S. Cl. 260—23.7 R **16 Claims**

1. Process of producing a heat-stabilized resin which comprises subjecting to curing temperatures a composition containing

	Parts by Weight
A butadiene polymer or copolymer resin	100
A tri(hydrocarbyl)trithiophosphite	0.5—4.0
A calcium soap	05.— 4.0
A peroxidecuring agent	0.5 – 6.0

the hydrocarbyl groups in said tri(hydrocarbyl)trithiophosphite containing 1-25 carbon atoms and being selected from the group consisting of aliphatic, cycloaliphatic, aromatic and aralkyl radicals, the resin being a homopolymer of butadiene or a copolymer of butadiene and styrene with an average molecular weight of at least 12,500, at least 50 percent of the resin having a molecular weight above 10,000 and at least 95 percent of the resin having a molecular weight above 2,000, and containing at least 40 percent by weight of butadiene with at least 80 percent of butadiene repeating units in the homopolymer or copolymer being in the 1,2 configuration, the calcium soap being a salt of abietic acid or a fatty acid containing 8 to 26 carbon atoms and the peroxide being one which gives radicals of the structure $R_2(CH_3CO.$ in which R represents a hydrocarbon radical of 1 to 20 carbon atoms.

3,855,165

NOVEL PROCESSING AIDS FOR RUBBER COMPOUNDS

Erwin Aron, 106 Railroad Ave., Clifton, N.J. 07509

Continuation-in-part of Ser. No. 128,549, March 26, 1971, abandoned. This application Sept. 20, 1973, Ser. No. 399,357

Int. Cl. C08c *11/72;* **C08d** *9/14*

U.S. Cl. 260—23.7 M **15 Claims**

1. A composition comprising:

a. From about 5 percent to about 15 percent of aromatic esters selected from the group consisting of (1) di-aryl- and di-arylalkyl phthalates; (2) di-aryl- and arylalkyl mono-glycolether phthalates; (3) phthalates from polyglycol monoethers of aryl and arylalkyl compounds wherein the polyglycol chain contains from 2 to 6 ethylene oxide groups in the chain; (4) di-benzoates of glycol, and propyleneglycol, and their di- and trimers; and (5) mixtures of the above,

b. From about 5 % to about 30 % of compounds with alcoholic or glycolic hydroxyl groups selected from the group consisitng of (1) straight or branched chain aliphatic alcohols having from about 8 to 20 carbons in the chain; (2) alkyl-phenoxy ethers of glycols or polyglycols wherein the alkyl group is limited to about 12 carbons in the chain, and the polyglycol grouping does not contain more than about 6 (CH_2—CH_2—O—) groups: (3) polypropylene glycol of approximately three propylene oxide groups in the molecule; and (4) mixtures of the above,

c. From about 5% to about 15% of potassium or sodium soaps made from commercial mixtures of fats or fatty acids containing from about 12 to about 18 carbons in the chain, said chains having only a small degree of unsaturation with more than 50% of them having 18 carbons in the chain,

d. From about 10% to about 30% of fatty acids having from about 12 to about 18 carbon atoms in the chain, said chains having only a small degree of unsaturation, with more than 50% of them having 18 carbon atoms in the chain,

e. From about 5% to about 10% of a metal soap where the metal is selected from the group consisting of zinc, magnesium, calcium or barium, and the fatty acid part of the soap has from about 12 to 18 carbon atoms in the chain and contains a high percentage of chains with a single double bond in the chain,

f. From about 15% to about 60% of hydrocarbons selected from the group consisting of mineral oil, mineral waxes, and petrolatum, or mixtures of them.

3,855,166

BINDER RESINS FOR ELECTRON PHOTOGRAPHY AND THE LIKE AND METHOD OF PRODUCTIVE THEREOF

Makoto Fukuda, Sagamihara; Tatsuo Nakano, and Ikuji Kishi, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha and Denki Kagaku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 26, 1973, Ser. No. 409,787

Int. Cl. C08f *45/52;* **G03g** *9/02*

U.S. Cl. 260—28.5 R **22 Claims**

1. A resin composition comprising 30 to 85% by weight of at least one polymer selected from the group consisting of polystyrene and copolymers of styrene-vinyl unsaturated monomers, 5 to 68% by weight of chlorinated paraffins having at least 30% by weight bound chlorine content, and 2 to 24% by weight of at least one aromatic compound represented by the formula:

(I)

and aromatic compounds represented by the formula:

(II)

wherein P and Q are an alkylene group; R, S and T are hydrogen or an alkyl group; and *l*, *m* and *n* are a positive integer.

3,855,167

PAVING COMPOSITIONS AND METHODS OF MAKING SAME

Harold M. Bowman, 475 Humiston Dr., Bay Village, Ohio 44140

Filed Sept. 29, 1969, Ser. No. 862,021

Int. Cl. C08g *51/52;* **C08h** *13/00;* **C08k** *1/62*

U.S. Cl. 260—28 **17 Claims**

1. In a method of making an asphalt pavement in which hot asphalt is mixed with a mineral aggregate to provide a paving composition that is formed into pavement relatively soon after mixing, the improvement comprising the steps of:

1. mixing (1) about 4 to 10%, by weight, of the paving compositions of hot asphalt having a penetration of about 60 to 90 with (2) a finely divided mineral aggregate having a mesh size of about 4 to 200 mesh in which each particle has a size not substantially larger than about one-sixteenth inch, the aggregate including (A) particles of uncoated sand and (B) about 2 to 60%, by weight, of the composition of particles of sand coated with an oil-soluble curable thermoplastic resin that is compatible with the asphalt and (3) sufficient amount of a hardening agent for curing the resin when contacted with the hot asphalt, and

2. forming the mixture of step (1) and hardening the same into asphalt pavement having high stability and good flow properties, the pavement having a stability of at least about 1,200 pounds by the Marshall stability test and a flow of about 7 to 15 as measured by the inclined glass plate flow test in which millimeters of flow of a 0.5 gram tablet of the resin heated to 125°C are recorded when the plate is inclined 65° from the horizontal.

3,855,168

ADHESIVE COMPOSITION FOR BONDING POLYESTER FIBER TO RUBBER

Takao Ozeki; Kazuo Ito, both of Ohtake; Yutaka Maeda, Iwakuni, and Takeshi Kudo, Ohtake, all of Japan, assignors to Mitsubishi Rayon, Ltd., Tokyo, Japan

Filed Aug. 1, 1972, Ser. No. 277,127

Claims priority, application Japan, Aug. 3, 1971, 46-58510; Aug. 6, 1971, 46-59470

Int. Cl. C08g 51/24

U.S. Cl. 260—29.3 11 Claims

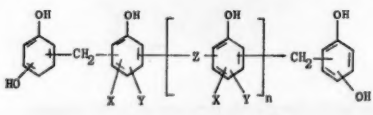
1. In an adhesive composition for bonding polyester fiber to rubber, which composition comprises:

i. a polynucleus halophenol compound,

ii. a thermosetting resin which is obtained by the reaction of resorcinol with formaldehyde in a molar ratio of resorcinol to formaldehyde within the range 1/0.7 to 1/3.0 in the presence of an alkali catalyst, and

iii. a rubber latex;

and wherein the solids weight ratio of (i)/(ii) is 10/1 to 1/10 and the solids weight ratio of ((i)+(ii))/(iii) is 2/1 to 1/10; the improvement which comprises employing as the polynucleus halophenol compound (i), a compound of the formula:



where X is chlorine or bromine, Y is chlorine, bromine, hydrogen, hydroxyl, or alkyl of 1 to 4 carbon atoms, Z is $-S_x-$ in which x is an integer of 1 to 4, $-S(O)_y-$ in which y is 1 or 2, or

in which R and R′ may be the same or different and are hydrogen, C_{1-8} alkyl, C_{6-18} aryl, C_{7-18} aralkyl, C_{1-8} haloalkyl or furyl, and n is an integer of 1 to 6.

3,855,169

ELECTROCOATING COMPOSITIONS AND METHOD FOR MAKING SAME

John H. Lupinski, Scotia, and Wilson J. Barnes, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 23, 1972, Ser. No. 265,533

Int. Cl. C08g 20/32

U.S. Cl. 260—29.2 N 4 Claims

1. Polyamide acid base mixtures having from about 0.05 to about 1.0 meq of base per gram of polyamide acid, comprising by weight,

A. 2 to 15% of a dispersed phase of a particulated polyamide acid having less than about 25 ppm of titratable chloride based on the weight of polyamide acid, which prior to being at least partially base neutralized is the product of reaction of substantially equal molar amounts of an organic diamine of the formula,

$$NH_2RNH_2,$$

and chloroformylphthalic anhydride,

B. 85 to 98% of a solvent phase containing as essential ingredients,

i. water and

ii. organic solvent selected from a class consisting of N,N-dimethylformamide, N,N-dimethylacetamide, N,N-diethylformamide, N,N-diethylacetamide, N,N-dimethylmethoxyacetamide, N-methylcaprolactam, dimethylsulfoxide, N-methyl-2-pyrrolidone, tetramethylurea, pyridine, dimethylsulfone, tetramethylenesulfone, N-methylformamide, and N-acetyl-2-pyrrolidone, where the ratio of i/ii has a value of from 3.75 to 1.0, R is selected from the class consisting of a divalent aromatic hydrocarbon radical having from 6 to 18 carbon atoms, and R′QR′, R′ is a divalent aromatic selected from the class R radicals and Q is a member selected from O,

$C_{(2-8)}$ alkylene, Si and S.

3,855,170

POWDER-RESISTANT ACRYLIC POLYMER FLOOR FINISHES

James H. Junkin, Oakland, Calif.; Martin E. Ginn, Park Forest, and Ernest T. Fronczak, Crystal Lake, both of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Continuation-in-part of Ser. No. 331,238, Feb. 9, 1973, abandoned. This application Dec. 14, 1973, Ser. No. 424,698

Int. Cl. C08f 37/18

U.S. Cl. 260—29.6 RW 12 Claims

1. An aqueous emulsion floor finish containing as the principal film forming polymer a zinc crosslinked acrylic polymer having a Knoop Hardness Number (KHN) of about 14 to 18, said principal polymer being suitable for use in a floor finish and having been prepared by the emulsion polymerization of a mixture of monomers selected from the group consisting of lower alkyl esters of acrylic acid, methacrylic acid, or mixtures thereof, or at least one of said esters together with a minor proportion of acrylic acid, methacrylic acid or mixtures thereof, said floor finish having incorporated therein in combination with said principal polymer the following modifying polymers:

a. from 1 to 10 parts by weight per 100 parts of said principal polymer of a hard acrylic polymer having a KHN of 19 to 25, said hard acrylic polymer having been prepared by emulsion polymerization of at least one lower alkyl ester of methyacrylic acid; and

b. from 1 to 10 parts by weight per 100 parts of said principal polymer of a soft acrylic polymer having a KHN of not over 5.0, said soft acrylic polymer having been prepared by emulsion polymerization of acrylate monomers selected from (i) at least one lower alkyl ester of acrylic acid and (ii) a mixture of (i) with at least one monomer selected from methacrylic acid, acrylic acid, and lower alkyl esters of methacrylic acid;

said hard polymer being present in relative proportions by weight of from 0.5 to 2 parts per each part of said soft polymer.

3,855,171

ORGANOPOLYSILOXANE COMPOSITIONS

Karl-Heinrich Wegehaupt, Burghausen; Gunther Kratel, Sankt Mang, and Manfred Leiser, Burghausen, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed May 1, 1972, Ser. No. 248,998

Int. Cl. C08g 51/04

U.S. Cl. 260—37 SB 16 Claims

1. A composition comprising an organopolysiloxane in which at least about 80 percent by weight of the organopolysiloxane is a diorganopolysiloxane of the formula

$$(HO)_x(SiR_yO_{4-y/2})_n H$$

in which R is selected from the group consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals, n is an integer of at least 3, x has an average value of from 0.99 to 1.01, y has an aver-

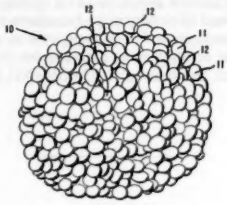
age value of from 1.99 to 2.01, and the sum of $x + y$ is 3 and pyrogenically produced mixed oxides of boron and an element selected from the class consisting of silicon, aluminum, titanium and iron, said mixed oxides containing from 2 to 20 percent by weight of boron calculated as elemental boron, said mixed oxides being present in an amount of from 0.005 to 20 percent by weight of boron based on the weight of the organopolysiloxane.

3,855,172

UNIFORM OXIDE MICROSPHERES AND A PROCESS FOR THEIR MANUFACTURE

Ralph K. Iler, and Herbert J. McQueston, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 7, 1972, Ser. No. 242,039
Int. Cl. 260 *395 B*; **C08g** *51/04*
U.S. Cl. 260—39 R **22 Claims**



1. A process for forming uniform-sized inorganic microparticles comprising the steps of:

a. forming a sol of uniform-sized inorganic colloidal particles in a polar liquid, said colloidal particles having a hydroxylated surface and being dispersible in said polar liquid, said colloidal particles being isodimensional or rod shaped particles with at least two dimensions in the range of 5 to 500 millimicrons and the third dimension in the range of 5 to 1,000 millimicrons;

b. forming a homogeneous solution of said sol with a polymerizable organic material comprising formaldehyde and a second organic material selected from the group consisting of urea and melamine

c. initiating polymerization of the organic material in said solution to cause coacervation of said organic material and said colloidal particles into substantially spherical microparticles having a diameter of about 0.5 to about 20 microns;

d. solidifying the microparticles so formed; and

e. collecting, washing and drying said microparticles.

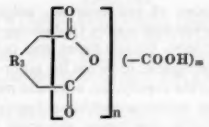
3,855,173

HIGH TEMPERATURE STABLE MODIFIED AROMATIC AMINE-ALDEHYDE MOLDING POWDERS MODIFIED WITH AROMATIC POLYCARBOXYLIC ACID, AND MOLDED ARTICLE

Rodney M. Huck, Longmeadow, and John R. LeBlanc, Wilbraham, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 302,342, Oct. 30, 1972, Pat. No. 3,792,020, which is a continuation-in-part of Ser. No. 119,536, March 1, 1971, abandoned. This application Sept. 26, 1973, Ser. No. 400,868
Int. Cl. C08g *9/06, 15/00*
U.S. Cl. 260—39 R **7 Claims**

1. An article of manufacture molded from a molding powder comprising a blend of: A. an aromatic polycarboxylic compound of general formula:



in which R_3 is an aromatic radical of three, four, five, or six valences and containing from 6 to 24 carbon atoms; n is an integer of from 0 through 3; m is an integer of from 0 through 6; and the sum of $2\ n + m$ is always equal to the valence of R_3; B. an aromatic amine-aldehyde resin characterized by having:

1. a number average molecular weight of from 200 to 1,000,
2. at least two aryl moieties per molecule, the aryl nucleus of each aryl moiety containing from 6 through 10 carbon atoms each,
3. at least one divalent bridging moiety of the formula:

wherein R_1 and R_2 are each individually selected from the group consisting of hydrogen, lower alkyl, lower alkylene, lower haloalkyl aryl of from 6 through 12 carbon atoms, haloaryl of 6 through 12 carbon atoms, and heterocyclic structures containing rings with 5 or 6 members, each heterocyclic ring containing an oxygen, a sulfur or a nitrogen atom, such heterocyclic structures being bonded to the carbon atom of said bridging moiety and wherein said bridging moiety has the unsatisfied valences of its carbon atom each bonded to a different one of said aryl moieties,

4. either at least one —NH group or at least one $—NH_2$, or both, per each resin molecule, one bond of which is directly attached to one of said aryl nuclei and the other bond of which is attached to another of said aryl nuclei or to a radical R_1 as defined above,
5. a number average of primary amine groups per said aryl moiety of less than about 0.99, and
6. a percent nitrogen acetyl of from about 3 to 30; wherein the realtive proportions of aromatic polycarboxylic compound and aromatic amine-aldehyde resin are such that the blend is thermosettable; and wherein the blend has been advanced at a temperature in the range of 300° to 600°F., and the volatiles generated by further heating to 600°F. for 10 minutes, have been reduced to less than 2 percent of the initial weight of the blend.

3,855,174

METHOD OF MANUFACTURE OF COMPOSITE MATERIALS CONSISTING OF CARBON FIBERS AND RESIN AND MATERIALS THUS OBTAINED

Michel Brie, Orsay, and Gerard Riess, Mulhouse, both of France, assignors to Commissariat a L'Energie Atomique, Paris, France

Continuation of Ser. No. 235,302, March 16, 1972, abandoned. This application Dec. 20, 1973, Ser. No. 426,553
Claims priority, application France, Mar. 19, 1971, 71.09822
Int. Cl. C08g *51/08*
U.S. Cl. 260—40 R **13 Claims**

1. A method of manufacture of a composite material of carbon fibers and resin comprising the steps of oxidizing and salifying the carbon fibers, then fixing on the treated carbon fibers by an ionic bond a block or graft copolymer of two different polymers which are incompatible with each other, the first of these polymers being an elastomer selected from

the group consisting of polyisoprene, polybutadiene, poly (butadiene-co-acrylic acid), poly (butadiene-co-methacrylic-acid), polyisobutylene, polysiloxanes and polyacrylates, the second polymer being selected from the group consisting vinyl acetate-vinyl chloride copolymer, alternate maleic anhydride-styrene copolymer, maleic anhydride-polyethylene copolymer and polyvinylpyridine copolymer, the ionic bond being selected from the group consisting of a hydrogen bond, a dipole-dipole bond and a saline bond and then incorporating the fibers thus treated in a resin compatible with the second polymer of the copolymers.

3,855,175

PROCESS FOR PREPARING NOVEL GLASS FIBER REINFORCED THERMOPLASTIC COMPOSITION

Tetsuji Kakizaki, c/o Jushikenkyujo Mitsubishi Petrochemical Co., Ltd., Yokkaichi, Japan

Continuation-in-part of Ser. No. 338,535, March 6, 1973, abandoned, which is a continuation-in-part of Ser. No. 175,355, Aug. 26, 1971, abandoned. This application Oct. 24, 1973, Ser. No. 409,065

Claims priority, application Japan, Sept. 1, 1970, 45-76488; Great Britain, Sept. 3, 1971, 40776/71

Int. Cl. C08f *45/10*

U.S. Cl. 260—42.15 **9 Claims**

1. A process for preparing a glass fiber reinforced thermoplastic composition which comprises

treating 5 – 60 percent by weight of glass fibers with 0.01 – 1.0 percent by weight based on the weight of said fibers, of an organosilane selected from the group consisting of bis-(β-hydroxyethyl)-γ-aminopropyltriethoxysilane, β-(3,4-epoxycyclohexyl) -ethyltrimethoxysilane, γ-glycidyloxypropyltrimethoxysilane, γ-aminopropyltriethoxysilane, N-β-(aminoethyl)-γ-aminopropyltriethoxysilane, and n-(dimethoxymethyl silylpropyl) ethylene diamine,

admixing said treated fibers with 95 to 40 weight percent of polypropylene, and 0.01–0.5 percent by weight of a peroxide, and 0.1 to 5.0 percent by weight of an organosilane coupling agent selected from the group consisting of vinyltriethoxysilane, vinyltrichlorosilane, vinyl-tris (β-methoxyethoxy)silane, γ-methacryloxypropyltrimethoxysilane, β-(3,4-epoxycyclohexyl)-ethyltrimethoxysilane, γ-glycidyloxypropyl-trimethoxysilane, γ-aminopropyltriethoxysilane, N-β-(aminoethyl)-γ-aminopropyltrimethoxysilane, bis (γ-hydroxyethyl)γ-aminopropyltriethoxysilane, γ-chloropropylmethoxysilane, γ-mercaptopropyltrimethoxysilane, n-(dimethoxymethyl silylpropyl) ethylene diamine, γ-chloroisobutyltriethoxysilane, β-cyclohexylethyltrimethoxysilane, phenyltriethoxysilane, amyltrimethoxysilane, vinyltrimethoxysilane, and mixtures thereof, and melt-shaping the resulting mixture.

3,855,176

LINER COMPOSITION FOR ROCKET MOTORS COMPRISING CROSSLINKED CARBOXY TERMINATED POLYBUTADIENE WITH INERT FILLER

Paul H. Skidmore, Frostburg, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 16, 1970, Ser. No. 14,831

Int. Cl. C08f *45/04, 45/08*

U.S. Cl. 260—42.28 **7 Claims**

1. A liner composition for rocket motors consisting of a carboxy terminated polybutadiene; an organo-metallic salt catalyst; a tri epoxy resin curing agent selected from the group consisting of the trifunctional epoxide of epichlorohydrin and p-aminophenol, the triglycidyl ether of epichlorohydrin and phenol-formaldehyde novolac and the triglycidyl ether of epichlorohydrin and glycerol; and a reinforcing inert filler material selected from the group consisting of colloidal silica, bentonite, carbon black and magnesium silicate; and wherein said carboxy terminated polybutadiene is present in an amount of from about 91 to 96 weight percent, said tri epoxy resin curing agent is present in an amount of from about 3 to about 5 weight percent and said inert filler is present in an amount from about 1.5 to about 3.5 weight percent.

3,855,177

PNEUMATIC TIRE TREADS AND THEIR PRODUCTION

Joseph C. Sanda, Jr., Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed June 8, 1972, Ser. No. 260,869

Int. Cl. 260 *859 R;* **C08g** *51/04;* **B60c** *1/00*

U.S. Cl. 260—42.47 **3 Claims**

1. A tread for a pneumatic tire composed of (a) an elastomeric polyisocyanate reaction product of an amino-terminated polyoxyalkylene in which each alkylene group contains 2 to 4 carbon atoms or (b) a diisocyanate reaction product of a blend of polyhydroxy butadiene-styrene copolymer and amino-terminated polyoxypropylene, and containing at least 30 parts of reinforcing pigment per 100 parts of the reaction product, the ratio of $NCO/(OH+NH_2)$ being at least 1.15.

3,855,178

METHOD FOR MAKING POLYETHERIMIDES

Dwain M. White, Schenectady, and Frank J. Williams, III, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,220

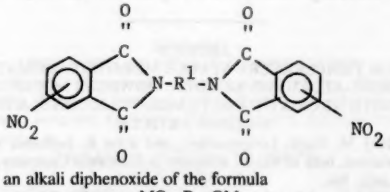
Int. Cl. C08f *45/54*

U.S. Cl. 260—45.7 S **10 Claims**

1. A method for stabilizing polyetherimide which comprises heating an organic solvent solution of said polyetherimide containing at least 1-10 percent by weight based on the weight of said polyetherimide of an alkali metal organic stabilizer of the formula,

$$R^2X'M$$

to a temperature of up to about 60°C for a time at least sufficient to stabilize such polyetherimide so that it will be substantially free of a tendency to gel at temperatures up to 315°C, where said polyetherimide has an intrinsic viscosity of at least 0.1 and is made by effecting reaction in a dipolar aprotic solvent at temperatures up to about 80°C between substantially equal molar amounts of a dinitro-bisimide of the formula



and an alkali diphenoxide of the formula

$$MO—R—OM$$

where R is an aromatic organic radical having from 6–30 carbon atoms, R^1 is an organic radical having from 1–20 carbon atoms, and R^2 is a monovalent organic radical selected from $C_{(1-8)}$ alkyl radical and aromatic organic radicals having from 6–20 carbon atoms, X' is a member selected from the class consisting of —O— and —S—, and M is an alkali metal ion selected from the class consisting of sodium, potassium and lithium.

3,855,179

STABILIZATION OF VINYL CHLORIDE POLYMERS

Anthony James Wilkins, and Peter Albert Theodore Hoye, both of Stourbridge, England, assignors to Albright & Wilson Limited, Oldbury, England

Continuation-in-part of Ser. No. 379,742, July 16, 1973, abandoned, which is a continuation of Ser. No. 839,072, July 3, 1969, abandoned. This application Sept. 21, 1973, Ser. No. 399,410

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 K 2 Claims

1. A vinyl chloride polymer composition stabilized against the deteriorative effects of heat wherein the vinyl chloride polymer contains between 80 and 100 percent by weight of repeating units derived from vinyl chloride, the remaining 0–20 percent being derived from ethylenically unsaturated monomers copolymerizable with vinyl chloride, and wherein a two-component stabilizer is present in an amount between 0.5 and 5 percent, based on the weight of vinyl chloride polymer, said stabilizer consisting of between 50 and 95 percent, based on the total stabilizer weight, of di-n-butyltin-S,S′-bis(isooctyl mercaptoacetate) or di-n-octyltin-S,S′-bis(isooctyl mercaptoacetate), the remaining portion of said stabilizer consisting of di-n-butyltin-S,O-mercaptoacetate or di-n-octyltin S,O-mercaptoacetate, with the proviso that the concentration of diorganotin S,O-mercaptoacetate does not exceed 1 percent, based on the weight of vinyl chloride polymer.

3,855,180

CURABLE COMPOSITIONS FROM BLEND OF MALEIMIDO COMPOUND AND VINYL ETHER

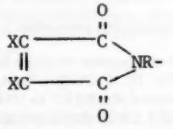
Siegfried H. Schroeter, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 164,818, July 21, 1971, Pat. No. 3,742,089. This application Apr. 9, 1973, Ser. No. 349,640

Int. Cl. C08g *20/20*

U.S. Cl. 260—47 UA 3 Claims

1. Solventless blend which consists essentially of, (A) a maleimido methyl substituted toluene having an average of 3 toluene rings and at least two chemically combined maleimido radicals of the formula,



and

(B) a vinyl ether of the formula,

$$CH{=}CH_2OY,$$

where there is utilized in such blends a proportion of (A) to (B) which is sufficient to provide a ratio of maleimido radicals of (A), to vinyl radicals of (B) having a value between 1 and 10 inclusive, R is an alkylene radical, X is selected from the group consisting of hydrogen, alkyl, halogen and mixtures thereof, and Y is a monovalent organo radical.

3,855,181

ARYL METHYLENE POLYMERS PREPARED FROM CHLORAL, BROMAL OR GLYOXALIC ACID

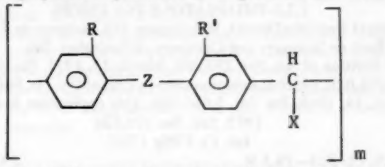
Tohru Takekoshi, Scotia, and Jimmy L. Webb, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 20, 1973, Ser. No. 343,138

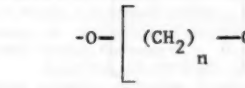
Int. Cl. C08g *5/02, 7/00, 1/12*

U.S. Cl. 260—49 7 Claims

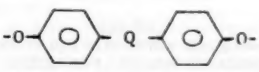
1. A polymer composed of recurring units of the formula



where R and R′ are members selected from the class consisting of hydrogen, halogen, and the methyl radical, X is a member selected from the class of —COOH and $—CY_3$ radicals, Z is a direct bond or is a member selected from the class consisting of —O—, —S—, the



radical, and divalent radicals of the general formula



where Y is chlorine or bromine, Q is a member of the class of —O—, —S—, $—SO_2—$,

and divalent alkyl radicals of from 1 to 4 carbon atoms, *m* is a whole number in excess of 1, and *n* and *q* are whole numbers from 1 to 2, inclusive.

3,855,182

PROCESS FOR OBTAINING POLYAMIDES FROM LACTAMS

M. Philippe Potin, and M. Michel Biesan, both of Billiere, France, assignors to Societe Aquitane-Total-Organico Tour Aquitaine, Courbevoie, France

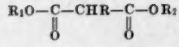
Filed Aug. 16, 1972, Ser. No. 281,225

Claims priority, application France, Aug. 25, 1971, 71.30754

Int. Cl. C08g *20/18*

U.S. Cl. 260—78 L 9 Claims

1. A process for obtaining high molecular weight polyamides which comprises anionically polymerizing at least one lactam having at least 4 carbon atoms in the ring in the presence of an alkali catalyst and mixing the resulting polymer with at least one compound of the formula:



wherein R_1 and R_2 are each lower alkyl and R is hydrogen or lower alkyl.

3,855,183
1,2,5-THIADIAZOLE POLYMERS

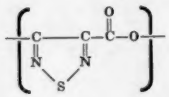
Robert Neal MacDonald, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 237,555, March 23, 1972, Pat. No. 3,786,028, which is a continuation-in-part of Ser. No. 866,401, Oct. 14, 1969, Pat. No. 3,664,986. This application Aug. 27, 1973, Ser. No. 391,526

Int. Cl. C08g *17/02*

U.S. Cl. 260—78.3 R **3 Claims**

1. A fiber- and film-forming polymeric 1,2,5-thiadiazole consisting essentially of recurring units of the formula



3,855,184
CROSSLINKING OF AROMATIC POLYMERS WITH ORGANIC POLYSULFONAZIDES

Edgar E. Bostick, 47 Saratoga Dr., Scotia, N.Y. 12302, and Alfred R. Gilbert, 1394 Dean St., Schenectady, N.Y. 12309

Division of Ser. No. 110,266, Jan. 27, 1971, Pat. No. 3,770,696. This application Aug. 1, 1973, Ser. No. 384,591

Int. Cl. C08f *7/02, 27/06*

U.S. Cl. 260—79.3 R **1 Claim**

1. A composition of matter comprising (a) polystyrene and (b) an amount of aromatic polysulfonazide sufficient to effect crosslinking of (a).

3,855,185
HYDROGENATION CATALYST

Frederick C. Loveless, Oakland, N.J., and Don H. Miller, Warren, Mich., assignors to Uniroyal, Inc., New York, N.Y.

Filed Feb. 9, 1972, Ser. No. 224,977

Int. Cl. C07b *1/00*; **C08d** *5/00*; **C08f** *27/25*

U.S. Cl. 260—80.78 **21 Claims**

1. A process for hydrogenating an organic compound which is a hydrocarbon having an olefinic double comprising contacting, under hydrogenation conditions, said organic compound with hydrogen in the presence of a hydrogenation catalyst in amount effective to catalyze hydrogenation of said organic compound, in an organic solvent medium selected from the group consisting of (i) inert saturated hydrocarbon solvent, (ii) inert aromatic hydrocarbon solvent, and (iii) the said organic compound to be hydrogenated when that compound is a liquid, the said hydrogenation catalyst being produced by the steps of:

A. first forming a hydrocarbon-soluble organometallic complex by contacting, in a hydrocarbon solvent medium,

a. an organic chelate compound of a transition metal selected from the group consisting of nickel, cobalt and iron with a chelating agent selected from the group consisting of beta-diketone and beta-ketoester, with

b. a phenolic substance selected from the group consisting of phenol, 2-alkylphenol, 4-alkylphenol, 2,4-dialkylphenol and 2,6-dialkylphenol wherein each alkyl group contains 1 to 10 carbon atoms,

the amount of (a) being from ½ to 2 moles, per mole of (b); and thereafter

B. mixing the resulting solution of hydrocarbonsoluble organometallic complex provided in step (A) with

c. an organometallic reducing agent of the formula MR_n where M is a metal selected from the group consisting of lithium, magnesium and aluminum, R is a hydrocarbon radical selected from the group consisting of saturated acyclic hydrocarbon radical having 1 to 12 carbon atoms, saturated cyclic hydrocarbon radical having 5 to 12 carbon atoms and aromatic hydrocarbon radical having 6 to 12 carbon atoms, and n is the valence of the metal M,

the amount of (c) being from 1 to 5 moles per combined moles of said organic chelate compound (a) plus said phenolic substance (b), whereby the said hydrogenation catalyst is produced in highly active form as a dispersion of said transition metal in reduced form.

3,855,186
PHOSPHORUS-CONTAINING POLYMERS

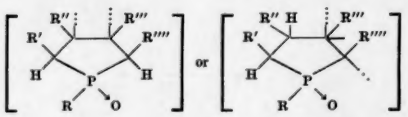
Kurt Moedritzer, Webster Grove, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed July 17, 1972, Ser. No. 272,249

Int. Cl. C08f *5/00, 45/00, 41/00*

U.S. Cl. 260—80 PS **4 Claims**

1. A phospholene oxide homopolymer characterized by the repeating units



and mixtures thereof in which R is hydrocarbyl of 1–20 carbon atoms and R′, R″, R‴, R⁗ are hydrogen or hydrocarbyl groups of 1–20 carbon atoms with the polymer having a molecular weight ranging from 200 to 1 million.

3,855,187
METHOD FOR PREPARING RESIN FEED

John C. Winkler, and Corley P. Senyard, both of Baton Rouge, La., assignors to Esso Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 63,311, Aug. 12, 1970, Pat. No. 3,676,412, which is a continuation of Ser. No. 800,803, Jan. 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 462,886, June 10, 1965, abandoned. This application June 13, 1972, Ser. No. 262,217The portion of the term of this patent subsequent to July 11, 1999, has been disclaimed.

Int. Cl. C08f *15/04*

U.S. Cl. 260—82 **5 Claims**

1. A process for preparing petroleum resins which comprises:

a. obtaining a naphtha fraction having a boiling point range of 200° to 500°F. by cracking a light gas oil having a boiling point range of about 185° to 1000°F. at a temperature of 1,100° to 1,550°F. in the presence of 0–95 mole percent steam for a time between 0.05 and 30 seconds;

b. removing naphthalenes and other condensed ring aromatics from said naphtha fraction and cracking any cyclodiene polymer present in said fraction to its monomer by distilling said naphtha fraction into a first overhead fraction boiling below 410°F. and a first bottoms containing naphthalenes and other condensed ring aromatics;

c. removing cyclodiene monomer present in said first overhead fraction by subjecting said first overhead fraction to a second distillation to separate a second overhead fraction boiling below 290°F. and containing said cyclodiene

monomer and a second bottoms boiling between 290°–410°F.;

d. subjecting said second overhead fraction to a third distillation to separate a third overhead fraction comprising C_5 and C_6 cyclodienes and a third bottoms containing C_7 and higher hydrocarbons, and

e. polymerizing said third bottoms by contacting with a Friedel-Crafts catalyst at a temperature between −20° and 200°F.

3,855,188

EMULSION POLYMERIZATION PROCESS UTILIZING ORGANOSULFUR MOLECULAR WEIGHT MODIFIER PREMIXED WITH EMULSIFIER AND REDUCING AGENT

Carl A. Uraneck, and John E. Burleigh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1973, Ser. No. 360,968

Int. Cl. C08f *1/13, 19/08*

U.S. Cl. 260—84.3 **20 Claims**

1. In a process of aqueous emulsion polymerization wherein at least one polymerizable monomer polymerizable with a redox or free radical initiator is polymerized under aqueous emulsion polymerization conditions in the presence of a redox or free radical initiator, aqueous emulsifier solution, organosulfur compound as molecular weight modifier, and aqueous medium, the steps comprising:

treating said aqueous emulsifier solution by admixing therewith with at least one reducing agent,

admixing said treated aqueous emulsifier with said organosulfur molecular weight compound modifier,

coagitating the resulting admixture sufficiently to increase the reactivity of said organosulfur compound as said modifier,

admixing said coagitated admixture of treated aqueous emulsifier and organosulfur molecular weight modifier with said polymerizable monomer and initiator and polymerizing the resulting polymerization admixture nder aqueous emulsion polymerization conditions, under

wherein said polymerizable monomer is a polymerizable conjugated diene, polymerizable monovinyl-substituted aromatic compound, or both, and can further include copolymerizable monoethylenically unsaturated materials, and said polymerization can include the presence of an unsaturated elastomer,

wherein said reducing agent is hydroxylamine, hydrazine, a substituted hydrazine, hydroquinone, aldehyde, paraldehyde, alkyl nitrile, or a Group IA alkali metal or ammonium sulfide, sulfite, dithionite, nitrite, hypophosphite, orthophosphite, or mixture, and wherein said reducing agent is employed in a minor amount effective to substantially prevent loss of said organosulfur compound molecular weight modifier during said coagitation;

wherein said emulsifier in said aqueous emulsifier solution is a nonionic or anionic emulsifier; and wherein said organosulfur compound molecular weight modifier is a mercaptan, dialkyldixanthogen, diaryldisulfide, tetraalkylthiuram monosulfide, tetraalkylthiuram disulfide, or mercaptothiazol.

3,855,189

POLAR COMPOUNDS IMPROVE EFFECTIVENESS OF POLYVINYL AROMATIC COMPOUNDS

Ralph C. Farrar, and Alvin C. Rothlisberger, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 11, 1972, Ser. No. 225,622

Int. Cl. C08d *5/02, 5/04*

U.S. Cl. 260—85.1 **11 Claims**

1. A polymerization process which comprises

a. introducing into a polymerization zone at least one polymerizable monomer selected from the group consisting of polymerizable conjugated dienes, polymerizable monovinyl-substituted aromatic compounds, and mixtures, under polymerization conditions employing an organolithium initiator,

b. polymerizing said polymerizable monomer with said organolithium initiator, thereby forming polymer-lithium moieties,

c. treating the resulting polymerization mixture with at least one polar compound in minor amount effective to improve coupling of said polymer-lithium, wherein said polar organic compound is ether, thioether, tertiary amine, or triazine, or mixture,

d. treating said polymerization reaction system with at least one polyvinyl aromatic compound in minor amount effective to couple said polymer-lithium moieties, wherein said polar compound is added to said polymerization mixture prior to or coincidentally with said polyvinyl aromatic compound.

3,855,190

PROCESS FOR SUSPENSION POLYMERIZATION OF VINYL CHLORIDE WITH LOW POLYMER DEPOSITION

Kieter Kurz; Johann Bauer; Thomas Balwe, all of Burghausen; Kurt Fendel, Leverkusen-Schildgen, and Alex Sabel, Burghausen, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Mar. 15, 1974, Ser. No. 451,502

Claims priority, application Germany, Mar. 16, 1973, 2313277

Int. Cl. C08f *3/30, 15/30*

U.S. Cl. 260—87.1 **8 Claims**

1. In the suspension polymerization process for the production of polymerizates selected from the group consisting of polyvinyl chloride and copolymerizates containing at least 80% of polyvinyl chloride, with low polymer deposits, which comprises the steps of mixing (1) monomers selected from the group consisting of vinyl chloride and mixtures of vinyl chloride with up to 20% by weight of olefinically monounsaturated compounds copolymerizable with vinyl chloride, (2) an oil-soluble free-radical-forming polymerization catalyst, (3) suspension stabilizers including protective colloids, and, optionally, other polymerization aids, and (4) water, heating said mixture under agitation to a polymerization temperature of between 0°C to 80°C, and recovering said polymerizate, the improvement which consists in using 0.001 to 1% by weight, based on the monomers, of at least one percompound selected from the group consisting of an unbranched dialkanoylperoxide having from 12 to 18 carbon atoms in each alkanoyl and an unbranched dialkylperoxy dicarbonate having 12 to 18 carbon atoms in the alkyl, as said oil-soluble free-radical-forming polymerization catalyst, adding from 5 to 35 ppm, based on the monomers, of a Wurster's salt to the polymerization charge, and conducting said polymerization at a pH of from 3.5 to 7, whereby a polymerizate is recovered with low polymer deposits.

3,855,191

POLYTETRAFLUOROETHYLENE MOLDING POWDERS OF TETRAFLUOROETHYLENE AND PERFLUORO (ALKYL VINYL ETHER) COPOLYMER

Thomas Russell Doughty, Jr., Philadelphia, Pa.; Carleton Angelo Sperati, Parkersburg, W. Va., and Howard Ho-Wei Un, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 4, 1973, Ser. No. 347,548

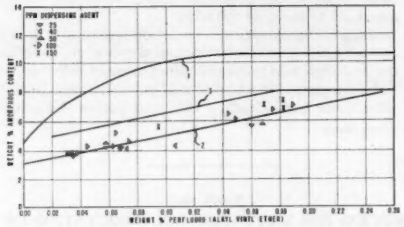
Int. Cl. C08f *15/02*

U.S. Cl. 260—87.5 A **5 Claims**

1. Polytetrafluoroethylene molding powder comprising a copolymer consisting of tetrafluoroethylene with from 0.02 to 0.26% by wt. of perfluoro(alkyl vinyl ether) wherein the alkyl group contains from 1 to 5 carbon atoms, said copolymer

having an amorphous content no greater than 8% by weight, provided that when the vinyl ether content is between 0.02%

EFFECT OF DISPERSING AGENT ON AMORPHOUS CONTENT OF TETRAFLUOROETHYLENE / PERFLUORO (ALKYL VINYL ETHER) COPOLYMER



and 0.18% by wt., the maximum amorphous content is calculated from the equation:

Wt. % Amorphous Content = (18.4 × wt. % vinyl ether) + 4.6%.

3,855,192

INHIBITING PREMATURE VULCANIZATION OF W-TYPE POLYCHLOROPRENE RUBBER WITH N-HYDROCARBYL-THIOIMIDES

Edward Raymond Rodger, Akron, Ohio, assignor to Monsanto Chemicals Limited, London, England

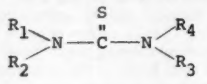
Continuation-in-part of Ser. No. 150,830, June 7, 1971, abandoned. This application Oct. 12, 1972, Ser. No. 299,875

Claims priority, application Great Britain, Oct. 26, 1971, 49699/71

Int. Cl. C08d *9/14*; **c08c** *11/06*; **C08c** *11/54*

U.S. Cl. 260—92.3 **23 Claims**

1. A process for inhibiting the prevulcanization of a W-type polychloroprene rubber composition comprising vulcanizing agent consisting of a metal oxide and a vulcanization accelerator which is a thiourea derivative having the formula



where (a) each of R_1 and R_4 independently is a hydrogen atom or is alkyl, chloroalkyl or cyanoalkyl of 1to 20 carbon atoms, alkenyl of 3 to 20 carbon atoms, cycloalkyl or alkylcycloalkyl of 5 to 10 carbon atoms, or aralkyl of 7 to 10 carbon atoms, and each of R_2 and R_3 is alkyl, chloroalkyl or cyanoalkyl of 1 to 20 carbon atoms, alkenyl of 3 to 20 carbon atoms, cycloalkyl or alkylcycloalkyl of 5 to 10 carbon atoms, or aralkyl of 7 to 10 carbon atoms, or (b) R_1 and R together with the nitrogen atom to which they are attached form a saturated cyclic group of 4 to 10 carbon atoms and R_3 and R_4 are the same as before, or (c) R_1 and R_2 together with the nitrogen atom to which they are attached form a saturated cyclic group of 4 to 10 carbon atoms and R_3 and R_4 together with the nitrogen atom which they are attached form a saturated cyclic group of 4 to 10 carbon atoms, which comprises incorporating into the unvulcanized rubber, in addition to the vulcanizing agent and the vulcanization accelerator, an N-substituted carboxylic imide in which the N-substituent is a group-S—R where R is alkyl of 1to 20 carbon atoms, aryl of 6 to 10 carbon atoms or cycloalkyl of 5 to 12 carbon atoms.

3,855,193

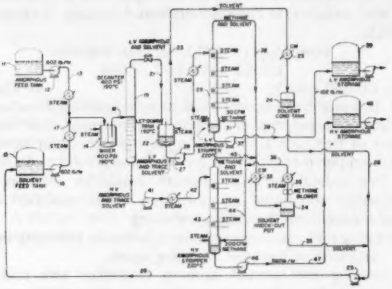
PROCESS FOR SEPARATING AMORPHOUS POLYOLEFINS INTO FRACTIONS HAVING DIFFERENT MELT VISCOSITIES

James S. Robinson, and Paul D. Folzenlogen, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,032

Int. Cl. C08f *47/00*, *3/08*; **C08f** *1/94*

U.S. Cl. 260—93.7 **8 Claims**



1. A process for separating amorphous olefin polymer into at least two fractions having different melt viscosities which comprises mixing said amorphous polymer at a temperature of 150° to 250°C. with solvent selected from acetone, methanol, ethanol, propanol, isopropanol or mixtures thereof at a pressure of at least the vapor pressure of acetone at the mixing temperature to form at least two separate layers, separating said separate layers and recovering the amorphous polymer contained in said layers to obtain amorphous polymer fractions having different melt viscosities than that of said amorphous polymer.

3,855,194

CURING RESINOUS HOMOPOLYMERS AND COPOLYMERS OF BUTADIENE OF HIGH 1,2-CONFIGURATION

Wendell Reed Conard, Kent, Ohio, assignor to The Firestone Tire and Rubber Company, Akron, Ohio

Filed Oct. 16, 1973, Ser. No. 406,792

Int. Cl. C08d *5/02*, *11/04*, *13/28*

U.S. Cl. 260—94.7 A **1 Claim**

1. The improvement in the two stage process of peroxide-curing a polymer of the class consisting of resinous homopolymers of butadiene and copolymers of butadiene and styrene, with and without solution in styrene-type monomers, said resin comprising at least 40% of butadiene and at least 80% of the repeating butadiene units being of the 1,2-configuration, which improvement comprises curing, in the first stage, with 0.2 to 5 parts per 100 parts of the resin of a lower-temperature-curing peroxide at 50° to 150° F. of a mixture of cobalt and iron naphthenates and 10 to 30 parts of pentanedione, using cobalt and iron naphthenates in the ratio of 3 to 50 parts by eight of cobalt naphthenate to 1 part of iron naphthenate, 0.2 to 2 parts by weight of cobalt being used per 100 parts of the peroxide and in the second stage, post-curing with a high-temperature curing peroxide at 250° to 400° F.

3,855,195

METHOD FOR PRODUCING PURE M-CRESOL

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Hirokazu Hosaka, Minoo, and Kazunari Ebara, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed July 22, 1971, Ser. No. 165,364

Claims priority, application Japan, July 22, 1970, 45-64636; Dec. 8, 1970, 45-10997; Dec. 8, 1970, 45-10998

Int. Cl. C07b *21/00*

U.S. Cl. 260—96.5 C 12 Claims

1. In a method for the recovery of m-cresol from a mixture consisting essentially of m-cresol and p-cresol which comprises treating the said mixture with urea to form a solid molecular compound of m-cresol and urea, separating the molecular compound from the resulting mixture, decomposing the molecular compound by heating to m-cresol and urea and separating m-cresol from the resultant mixture, the improvement wherein the formation of the molecular compound is carried out in a solvent selected from the group consisting of benzene, benzene substituted with 1 to 3 alkyl groups of 1 to 4 carbon atoms and/or 1 or 2 halogen atoms, dialkyl ethers of which the alkyl moiety has 2 to 5 carbon atoms, tetrahydrofuran and dioxane.

3,855,196

BIOLOGICALLY ACTIVE PEPTIDE AND METHOD OF PREPARING THE SAME

Hidehiko Matsukawa, c/o Tsukasa Sasaki, No. 139 Suwamachi, Shinjuku-ku; Haruo Ito, Kumegawa Jutaka Kodan, No. 1-4 Misumicho, Higashimurayama-shi, and Taneko Suzuki, 18-13, 7-chome, Nishi-Shinjuku, Shinjuku-Ku, all of Tokyo, Japan

Division of Ser. No. 240,485, April 3, 1972, Pat. No. 3,794,561. This application Sept. 10, 1973, Ser. No. 395,881

Claims priority, application Japan, Sept. 30, 1971, 46-76596; Sept. 30, 1971, 46-76597; Sept. 30, 1971, 46-76598; Sept. 30, 1971, 46-76599; Sept. 30, 1971, 46-76600

Int. Cl. C07g *7/00*

U.S. Cl. 260—112 R 1 Claim

1. The biologically active peptide prepared by the method which comprises decomposing enzymatically the skeletal muscles or the visceral muscles of an animal of the family Cervoidae with a protease to provide low molecular weight peptide product, collecting the soluble portion of the product in a water-containing hydrophilic solvent, subjecting the solution of the product thus collected to a separation procedure using a gel-type molecular sieve or an ion-exchange resin, and collecting the effective fractions thus separated.

3,855,197

GLYCOPROTEINS EXTRACTED FROM MICROORGANISMS

Jean Hirsch, Paris, and Jean Pierre Buret, Osny, both of France, assignors to Laboritoires Cassenne, Paris, France

Continuation-in-part of Ser. No. 38,482, May 18, 1970, abandoned. This application Feb. 7, 1973, Ser. No. 330,403

Claims priority, application France, May 20, 1969, 72.016297; Feb. 15, 1972, 72.005016

Int. Cl. C07g *7/00*; C12d *13/06*

U.S. Cl. 260—112 R 14 Claims

1. Glycoproteins extracted from at least one type of microbial bodies selected from the group consisting of Pneumococci, Streptococci, Neisseria, Micrococci, Staphylococci, *Klebsellia pheumoniae and Hemophilus influenzae* and from a mixture of at least 2 of the said strains or an association of different types of the same microbial species, said glycoproteins having a molecular weight of at least 1,000,000, being thermo stable and soluble in perchloric acid, phytic acid, ammonium sulfate and trichloroacetic acid, having a content of at least 50 percent, preferably 60 to 65 percent, of combined hexoses, a biuretogenic substance content of about 10 percent, a ratio of combined hexoses to protides of about 7, a molecular volume Ve/VO as determined through Sephadex G 200 gel of 1.0 to 1.2 in relation to a buffer with a pH of 8, an α-amine nitrogen content of 1 to 2 percent and a migration by electrophoretic density gradient comprised between α-proteins and β-proteins and acid hydrolysis under reduced pressure shows the presence of glucose, galactose and mannose but not ribose.

3,855,198

NOVEL INTERMEDIATES FOR SYNTHESIS OF—L(5-OXOPROLYL)-L-HISTIDY-L-TRYPLOPHYL-L-SERYL-L-TYROSYL-L-GLYCYL-L-LEUCYL-L-ARGINYL-L-PROLYL-GLYCENE AMIDE

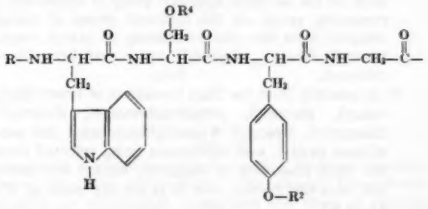
Dimitrios Sarantakis, Audubon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sept. 29, 1972, Ser. No. 293,715

Int. Cl. C07c *103/52*; A61k *27/00*

U.S. Cl. 260—112.5 24 Claims

1. A tetrapeptide compound of the formula



19. A process for preparing L-(5-oxoprolyl)-L-histidyl-L-tryptophyl-L-seryl-L-tyrosyl-glycyl-L-leucyl-L-arginyl-L-prolyl-glycine amide which comprises the steps of:

a. reacting R—Trp—OH with a carboxyl group activating reagent;

b. reacting the activated compound obtained in step (a) with H—Ser(R^4)—OR^5 to form the dipeptide R—Trp—Ser(R^4)—OR^5;

c. reacting said dipeptide obtained in step (b) with hydrazine to obtain R—Trp—Ser(R^4)—$NHNH_2$;

d. reacting said dipeptide obtained in step (c) with a reagent yielding nitrous acid in the presence of a strong acid to form R—Trp—Ser(R^4)—N_3;

e. reacting R—Trp—Ser(R^4)—N_3 with H—Tyr(R^2)—Gly—OR^5 to form the tetrapeptide R—Trp—Ser(R^4)—Tyr(R^2)—Gly—OR^5;

f. reacting the tetrapeptide of step (e) with hydrazine to obtain R—Trp—Ser(R^4)—Tyr(R^2)—Gly—$NHNH_2$;

g. reacting R—Arg(N^G—R^3)—OH with a carboxyl group activating reagent;

h. reacting the activated compound obtained in step (g) with H—Pro—OR^5;

i. cleaving the α-amino protecting groups from said dipeptide obtained in step (h), said cleaving reagent being one to which said R^3 and R^5 groups are stable;

j. reacting the dipeptide H—Arg(N^G—R^3)—Pro—OR^5 with a compound of the formula R—Leu—OH having its carboxyl group activated, to form the tripeptide R—Leu—Arg(N^G—R^3)—Pro—OR^5;

k. hydrolyzing the tripeptide obtained in step (j) to split off the carboxylic acid ester group and obtain the tripeptide R—Leu—Arg(N^G—R^3)—Pro—OH;

l. reacting said tripeptide obtained in step (k) with a carboxyl group activating reagent and reacting the resulting activated compound with glycinamide to obtain the tetrapeptide R—Leu—Arg(N^G—R^3)—Pro—Gly—NH_2;

m. cleaving the α-amino protecting group from the tetrapeptide obtained in step (l);

n. reacting the tetrapeptide R—Trp—Ser(R^4)—Tyr(R^2)—Gly—$NHNH_2$ with a reagent yielding nitrous acid in the presence of a strong acid to form R—Trp—Ser(R^4)—

Tyr(R^2)–Gly–N_3 and reacting said tetrapeptide with H–Leu–Arg(N^G–R^3)–Pro–Gly–NH_2 to form the octapeptide R–Trp–Ser(R^4)–Tyr(R^2)–Gly–Leu–Arg(N^G–R^3)–Pro–Gly–NH_2;

o. cleaving the α-amino and side chain protecting groups from the octapeptide formed in step (n) and reacting the deprotected octapeptide with p–Gly–His–N_3; wherein:

R is an α-amino protecting group characterized by not being split off during the coupling of the amino acid residues which form said octapeptide and capable of being split off under reaction conditions which will not result in cleavage of the peptide chain;

R^2 is selected from the class consisting of acetyl, tosyl, benzoyl, benzyl, tert-butyl, trityl and benzyloxycarbonyl;

R^3 is selected from the class consisting of nitro, tosyl, adamantyloxycarbonyl, benzyloxycarbonyl and tosyl;

R^4 is selected from the class consisting of the hydrogen atom on the alcoholic hydroxyl group of serine and a protecting group on the hydroxyl group of serine selected from the class consisting of acetyl, tosyl, benzoyl, benzyl, tert-butyl, trityl, and benzyloxycarbonyl;

R^5 is selected from the class consisting of lower alkyl, benzyl, phenacyl, phthalimidomethyl, β-methylthiomethyl, 4-picolyl, 4-(methylthio)phenyl and substituted benzyl, said substituent being selected from the class consisting of methoxy, methyl and nitro; and with the proviso that R is not the same as R^2, R^3, or R^4.

3,855,199
P-GLU-D-PHE-T RP-SER-TYR-D-ALA-LEU-ARG-PRO-GLY-NH2-AND INTERMEDIATES

Theodore J. Foell, and John P. Yardley, both of King of Prussia, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 3, 1973, Ser. No. 402,958
Int. Cl. C07c *103/52;* **C07g** *7/00;* **A61k** *27/00*
U.S. Cl. 260—112.5 **8 Claims**

1. A compound selected from the group consisting of

L-p-Glu-D-Phe-L-Trp-L-Ser-L-Try-D-Ala-L-Leu-L-Arg-L-Pro-Gly-NH_2

and

R^4-L-P-Glu-D-Phe-L-Trp-L-Ser(R^3)-L-Tyr-(R^2)-D-Ala-L-Leu-L-Arg-(N^G-R^1)-L-Pro-Gly-R

and its non-toxic salts; wherein

R is selected from the class consisting of NH_2, OH, O-(lower)-alkyl and O-benzyl; R^1 is a protecting group for the N^δ, N^ω and $N^{\omega'}$ nitrogen atoms of arginine selected from the class consisting of nitro, tosyl, benzyloxycarbonyl, and adamantyloxycarbonyl; or R^1 is hydrogen;

R^2 is a protecting group for the phenolic hydroxyl group of tyrosine selected from the class consisting of acetyl, tosyl, benzoyl, tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,4 dichlorobenzyl and benzyloxycarbonyl or R^2 is hydrogen;

R^3 is a protecting group for the alcoholic hydroxyl group of serine and is selected from the class consisting of acetyl, tosyl, benzoyl, tetrahydropyranyl, tert-butyl, trityl, 2,4 dichlorobenzyl, benzyl and benzyloxycarbonyl; or R^3 is hydrogen;

R^4 is selected from the class consisting of hydrogen or an α-amino protection group, with the proviso that at least one of R^1, R^2 and R^3 is a protecting group.

3,855,200
PROCESS FOR PREPARING 8-HYDROXYERTHROMYCIN A AND INTERMEDIATES THEREFOR

Krzysztof Krowicki, and Aleksander Zamojski, both of Warsaw, Poland, assignors to Polska Akademia Nauk, Warsaw, Poland

Filed Apr. 23, 1973, Ser. No. 353,929
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 E **12 Claims**

1. The process which consisting essentially of reacting 8,9-anhydroerythromycin A 6,9-hemiketal with m-chloroperbenzoic acid in a mixture of ethyl acetate and water to form the N-oxide of 8-hydroxyerythromycin A 6,9-hemiketal and then reducing said N-oxide with hydrogen in the presence of a platinum or palladium catalyst to produce 8-hydroxyerythromycin A.

3,855,201
METHOD OF PRODUCING GLUCOFRANGULIN OF TECHNICAL PURITY

Stanislaus Buchner, Birsfelden, and Dragica Fischer, Basel, both of Switzerland, assignors to Solco Basel AG, Basel, Switzerland

Filed July 12, 1971, Ser. No. 161,524
Claims priority, application Luxembourg, July 13, 1970, 61323; June 22, 1971, 63400
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 F **5 Claims**

1. A continuous method for producing technically pure glucofrangulin from an aqueous alcoholic raw extract of alder buckthorn bark containing impurities comprising frangulin and emodin which consists essentially of the steps of:

a. precipitating impurities poorly soluble in water from said raw extract by treating it with water;

b. removing said impurities poorly soluble in water by filtration to produce a prepurified glucofrangulin containing raw extract;

c. subjecting said prepurified raw extract to countercurrent liquid-liquid extraction with a binary solvent system consisting of (1) an organic phase consisting of water-saturated butanol or higher aliphatic alcohol, methyl ethyl ketone, methylisobutyl ketone or water saturated mixture thereof and (2) an aqueous phase saturated with the organic phase adjusted to a pH of about 5.5, to effect preferential transfer of said glucofrangulin into said organic phase;

d. countercurrently contacting the thus obtained glucofrangulin-containing organic phase from step (c) with an aqueous phase adjusted to a pH of about 4 to effect preferential transfer of glucofrangulin from said organic phase into said aqueous phase;

e. evaporating said glucofrangulin-containing aqueous phase from step (d) to recover glucofrangulin of technical purity;

f. countercurrently contacting the organic phase from step (d) with an aqueous phase adjusted to pH of about 6.5 or above, to effect preferential transfer of impurities into said aqueous phase with retention of glucofrangulin in said organic phase;

g. discarding said aqueous phase from step (f);

h. evaporating said organic phase from step (f) to recover organic solvent therefrom, thereby producing a residue containing glucofrangulin, emodin and frangulin and

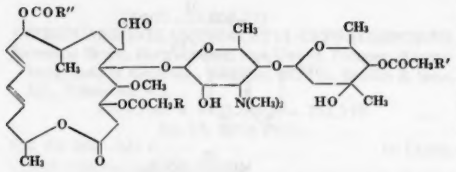
i. adding said residue of step (h) along with a new portion of prepurified raw extract to step (c).

3,855,202
ONE STEP PROCESS FOR THE PRODUCTION OF A MONOESTER OF MACROLIDE ANTIBIOTICS

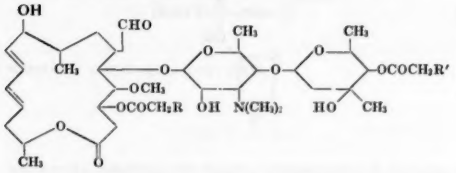
Shoji Omoto, Tokyo; Shigeharu Inoue, and Taro Niida, both of Yokohama, all of Japan, assignors to Meiji Seika Karsha, Ltd., Tokyo, Japan

Filed June 15, 1972, Ser. No. 262,967
Int. Cl. C07c *129/18*
U.S. Cl. 260—210 AB **5 Claims**

1. A process for the production of a mono-ester of the SF-837 substance of the formula:



wherein R is a methyl group, R′ is a methyl group, and R″ is an alkyl goup of 1 – 4 carbon atoms; an alkyl group of 1 – 4 carbon atoms substituted with phenyl, trimethyl, carboxyl, phenoxy or bromo; an alkenyl group of 1 – 4 carbon atoms; styryl; phenyl or pyridyl group, which comprises reacting the SF-837 substance of the formula:



wherein both R and R′ are methyl groups with an acyl halide of the formula

R″COX

wherein R″ is as defined above and X is a chlorine or bromine atom in solution in a solvent selected from benzene, toluene, ethyl acetate and methyl isobutyl ketone and in the presence of a quantity of an acid-binding agent selected from pyridine and picoline.

3,855,203

4″-O-SULFONYL ERYTHROMYCIN-9-O-OXIME DERIVATIVES

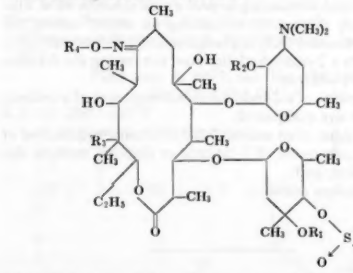
Robert Hallas, Waukegan; John Soloman Tadanier, Chicago, and Anne Mary Von Esch, North Chicago, all of Ill., assignors to Abbott Laboratories, Chicago, Ill.

Filed May 3, 1973, Ser. No. 356,987

Int. Cl. C07c *129/18*

U.S. Cl. 260—210 E **4 Claims**

1. A 4″-O-sulfonyl erythromycin-9-O-oxime derivative of the following structural formula:



where R is selected from the group consisting of loweralkyl or loweralkenyl, R_1 is hydrogen or methyl, R_2 is hydrogen or loweralkanoyl, R_3 is hydrogen or hydroxyl, and R_4 is selected from the group consisting of loweralkyl or lower cycloalkyl.

3,855,204

PROCESS FOR PREPARING ADENOSINE-5′-CARBOXYLIC ACID, ETHYL ESTER

Raj Nandan Prasad, Pierrefonds, Quebec, Canada, assignor to Abbott Laboratories, Chicago, Ill.

Filed Oct. 27, 1972, Ser. No. 301,693

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **1 Claim**

1. A method of synthesizing adenosine-5′-carboxylic acid, ethyl ester, consisting essentially of the steps of reacting 2′,3′-isopropylidene adenosine-5′-carboxylic acid with ethanol in N-ethoxycarbonyl-2-ethoxy-1,2-dihydroquinoline at a temperature of from 20° to 30° C. for from 6 to 32 hours, and cleaving the isopropylidene protecting group by suspending the resulting compound in a weak acid selected from the group consisting of formic acid and acetic acid at a temperature of about 40° C.

3,855,205

PROCESS FOR PREPARING ADENOSINE-5′-CARBOXYLATES

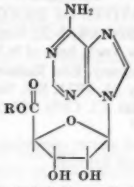
Raj Nandan Prasad, Pierrefonds, Quebec, Canada, and Francis Elmer Fischer, Waukegan, Ill., assignors to Abbott Laboratories, Chicago, Ill.

Filed Oct. 3, 1972, Ser. No. 294,699

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **3 Claims**

1. A method of synthesizing a compound of the formula



wherein R is loweralkyl, halololoweralkyl, hydroxyloweralkyl, lower cycloalkyl, loweralkenyl, loweralkynyl, loweralkylcycloalkyl or alkoxyalkyl, comprising the steps of reacting adenosine-5′-carboxylic acid with thionyl chloride and an alcohol of the formula ROH wherein R is as defined above at a temperature of from 0° C. to −20° C.

3,855,206

ADENOSINE-5′-CARBOHYDROXAMIC ESTERS

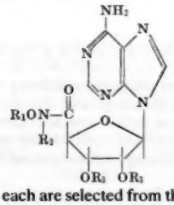
Raj Nandan Prasad, Pierrefonds, Quebec, Canada, and Herman Hal Stein, Skokie, Ill., assignors to Abbott Laboratories, Chicago, Ill.

Filed Apr. 11, 1973, Ser. No. 350,233

Int. Cl. C07d *51/54*

U.S. Cl. 260—211.5 R **9 Claims**

1. A compound of the formula



wherein R_1 and R_2 each are selected from the group consisting of hydrogen, loweralkyl, halololoweralkyl, hydroxyloweralkyl, loweralkylcycloalkyl, loweralkylcycloalkyl, loweralkenyl, loweralkynyl, an alkoxy loweralkyl having from one to six carbon atoms or a lowercycloalkyl having from three to six carbon atoms, with the limitation that when R_1 is hydrogen, R_2 cannot be hydrogen; wherein each R_3 is hydrogen or when taken together form an isopropylidene or benzylidene moiety, and the pharmaceutically acceptable acid addition salts thereof.

3,855,207

9ALPHA,11ALPHA-EPOXY SPIROLACTONES, SPIROLACTOLS AND LACTOL ETHERS CORRESPONDING

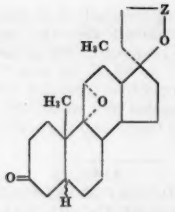
Edward A. Brown, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 220,441, Jan. 24, 1972, abandoned. This application Nov. 19, 1973, Ser. No. 417,376

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.55 R **9 Claims**

1. A compound formula



wherein Z is selected from the group consisting of carbonyl, hydroxymethylene and (lower alkoxy)methylene radicals and the wavy line represents the α or β configuration.

3,855,208

DERIVATIVES OF DIGOXIGENIN

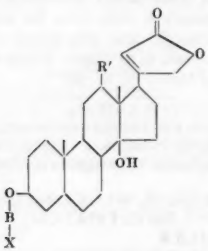
Herman Rutner, Hackensack, N.J.; Raul Rapun, Suffern, and Nathan Lewin, New York, both of N.Y., assignors to Becton Dickinson and Company, East Rutherford, N.J.

Filed May 24, 1971, Ser. No. 146,545

Int. Cl. C07c *173/00*

U.S. Cl. 260—239.57 **36 Claims**

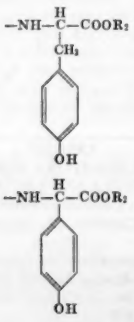
1. A composition of matter comprising a compound having the following structural formula:

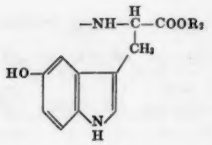


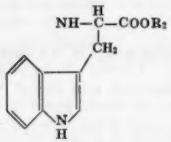
wherein R′ is selected from the group consisting of —OH and $OCOCH_3$;

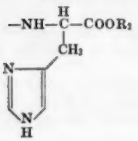
B is selected from the group consisting of succinyl, maleyl, fumaryl and o-phthaloyl; and

X is an amino acid radical selected from the group consisting of unlabeled and radiolabeled amino acid radicals having the following structural formulae:









wherein R_2 is selected from the group consisting of hydrogen and lower alkyl.

3,855,209

SYNTHESIS OF INDOLININIUM METHINE DYES

Vinton A. Hoyle, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 4, 1973, Ser. No. 394,033

Int. Cl. C07d *27/56*

U.S. Cl. 260—240 E **10 Claims**

1. Process for the preparation of a cationic indolininium methine dye compound having the formula

$$[A—CH=CH—B]^+ X^-$$

which comprises contacting a preformed solution of a Vilsmeier adduct, formed by contacting an amine having the formula H—B with $POCl_3$ or phosgene and a di-lower alkylformamide, with a 2-methylindolininium salt having the formula $A—CH_3^+ X^-$, wherein

A is the residue of a 2-indolininium component of a cationic methine dye compound;

B is the residue of an aniline, 1,2,3,4-tetrahydroquinoline or indole component of a cationic or disperse methine dye compound; and

X is a colorless anion.

3,855,210

IMPROVED BIS(HYDROXYALKYL) STYRYL DYE COMPOUNDS AND PHOTOSENSITIVE MEDIA CONTAINING SUCH COMPOUNDS

Juergen H. H. Keller, Chelmsford, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Feb. 3, 1969, Ser. No. 796,167

Int. Cl. C09b *23/14*

U.S. Cl. 260—240.9 **5 Claims**

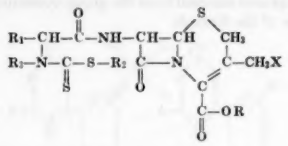
1. 2-[p-Di(hydroxyethyl)aminostyryl]-5-methyl-3-hydroxyethylthiadiazolium chloride.

3,855,211
DITHIOCARBONYLAMINOACETYL CEPHALOSPORINS

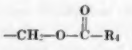
Hermann Bruer, Burgweinting, and Uwe D. Treuner, Regensburg, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 9, 1972, Ser. No. 261,195
Int. Cl. C07d 99/24
U.S. Cl. 260—243 C 10 Claims

1. A compound of the formula



wherein R is hydrogen, lower alkyl,



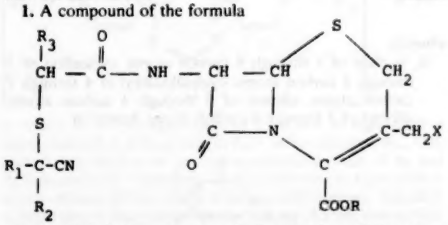
alkali metal, alkaline earth metal or triethylamine; R_1 is hydrogen, lower alkyl, cyclopentyl, cyclohexyl, cyclohexenyl, cyclohexadienyl, R_3-phenyl, thienyl or furyl; R_2 and R_4 each is lower alkyl, phenyl or phenyl-lower alkyl; R_3 is hydrogen, lower alkyl or phenyl; R_5 is hydrogen, halogen, lower alkyl or lower alkoxy; and X is hydrogen, hydroxy, lower alkanoyloxy, lower alkylthio or lower alkoxy.

3,855,212
CYANOMETHYLTH IOACETYLCEPHALOSPORINS

Hermann Breuer, and Uwe Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 4, 1972, Ser. No. 278,168
Int. Cl. C07d 99/24
U.S. Cl. 260—243 C 7 Claims

1. A compound of the formula



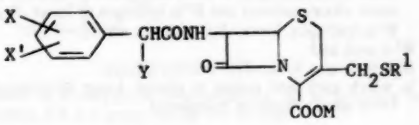
wherein R is hydrogen or a salt forming ion of the group consisting of aluminum, alkali metal, alkaline earth metal, lower alkylamine, phenyl-lower alkylamine, N,N'-dibenzylethylenediamine, procaine or lower alkylpiperidine, R_1 and R_2 each is hydrogen, lower alkyl, lower alkenyl, phenyl, hydroxyphenyl, chlorophenyl, benzyl, phenethyl, or R_1 and R_2 together complete a cyclopentyl or cyclohexyl group, R_3 is hydrogen, lower alkyl or lower alkenyl, and X is hydrogen, lower alkanoyloxy or pyridinium.

3,855,213
3-HETEROCYCLIC THIOMETHYL-CEPHALOSPORINS

George L. Dunn, Wayne, and John R. E. Hoover, Glenside, both of Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

Continuation-in-part of Ser. Nos. 116,599, Feb. 18, 1971, and Ser. No. 262,903, June 14, 1972, , which is a continuation-in-part of Ser. No. 116,598, Feb. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,296, Dec. 17, 1970, abandoned, said Ser. No. 116,599, is a continuation-in-part of Ser. No. 99,296,. This application Sept. 15, 1972, Ser. No. 289,499
Claims priority, application South Africa, Nov. 8, 1971, 71/7457
Int. Cl. C07d 99/24
U.S. Cl. 260—243 C 12 Claims

1. A compound of the formula



in which:

X and X' are each hydrogen, lower alkyl of 1–4 carbon atoms, lower alkoxy of 1–4 carbon atoms, hydroxy, hydroxymethyl, halo, nitro, amino, mercapto, lower alkylthio of 1–4 carbon atoms, aminomethyl or trifluoromethyl;

Y is OH,

R^1 is triazolyl which is unsubstituted or substituted with 1 or 2 R^2 groups selected from the group consisting of lower alkyl or alkoxy of up to 4 carbon atoms, cycloalkyl of up to 6 carbon atoms, alkenyl of up to 6 carbon atoms, lower alkoxyalkyl of 2 to 8 carbon atoms, trifluoromethyl, amino, alkylamino, dialkylamino, lower alkylthio of up to 4carbon atoms, phenyl, and halo; and

M is hydrogen or an alkali metal.

3,855,214
2,3-DIHYDRO-1H-PYRIDINO[2,3-B][1,4]-THIAZINE-2-ONE-4-OXIDE

William Rodney Roderick, Libertyville, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 151,483, June 9, 1971, Pat. No. 3,733,411. This application Sept. 28, 1972, Ser. No. 293,253
Int. Cl. C07d 93/12
U.S. Cl. 260—243 R 1 Claim

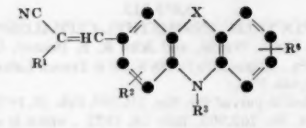
1. 2,3-Dihydro-1H-pyridino-[2,3-*b*][1,4]-thiazin-2-one 4-oxide.

3,855,215
METHINE COMPOUNDS

John G. Fisher, and Curtis E. Diebert, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 215,440, Jan. 4, 1972, abandoned. This application Feb. 7, 1973, Ser. No. 330,357
Int. Cl. C09b 23/00
U.S. Cl. 260—243 A 7 Claims

1. A compound of the general formula

(I) 

wherein

X is oxygen or sulfur;

R^1 is cyano; alkoxycarbonyl containing from one to about nine carbon atoms; alkoxycarbonyl containing 3–5 carbon atoms substituted on the beta, gamma or delta carbon atom with one substituent selected from the group consisting of lower alkoxy, hydroxy, cyano, halogen; lower alkylsulfonyl; arylsulfonyl; or the group $-CONR^4R^5$ in which R^4 is hydrogen, lower alkyl, aryl or, when R^5 is hydrogen, R^4 also can be lower alkanoyl or lower alkoxycarbonyl and R^5 is hydrogen or lower alkyl;

R^2 is hydrogen, lower alkyl or lower alkoxy;

R^3 is aryl; and

R^6 is hydrogen, lower alkyl or lower alkoxy;

in which each aryl moiety is phenyl, lower alkylphenyl, lower alkoxyphenyl or halophenyl.

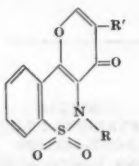
3,855,216

SUBSTITUTED PYRANO(3,2-C)(1,2)BENZOTHIAZINE 6,6-DIOXIDES

Daniel Kaminsky, Parsippany; Sylvester Klutchko, Hackettstown, and Maximilian Von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 29, 1973, Ser. No. 365,399
Int. Cl. C07d 99/10
U.S. Cl. 260—243 R **10 Claims**

1. A compound of the formula I:



I

wherein R represents hydrogen and lower alkyl and R′ represents lower alkyl, hydroxymethyl, and carboxaldehyde and the thiosemicarbazone of the carboxaldehyde.

3,855,217

IMPROVED PROCESS FOR PREPARING N-BENZYLICALLY SUBSTITUTED AZIRIDINES

Bruce P. Thill, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 24, 1972, Ser. No. 246,873
Int. Cl. C07d 23/06
U.S. Cl. 260—239 E **10 Claims**

1. In the process of preparing N-benzylically substituted aziridines comprising reacting by contacting (a) a benzyl chloride, bromide or iodide which may bear one or more substituents on the ring which are inert in the process, with (b) a non-N-substituted aziridine at a temperature of from about 0°C. to about 100°C. and in the presence of (c) an acid acceptor, the improvement consisting of conducting said process in a liquid aromatic hydrocarbon reaction medium.

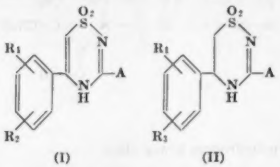
3,855,218

5-ARYL-1,2,4-THIADIAZINE 1,1-DIOXIDES AND 5,6-DIHYDRO-ARYL-1,2,4-THIADIAZINE 1,1-DIOXIDES

William L. Matier, and William T. Comer, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed June 11, 1973, Ser. No. 368,549
Int. Cl. C07d 93/22
U.S. Cl. 260—243 R **11 Claims**

1. A compound selected from the group consisting of 1,2,4-thiadiazines of the formula



(I) (II)

and a pharmaceutically acceptable metal salt thereof wherein

R_1 is selected from hydrogen or halogen;

R_2 is selected from hydrogen, halogen, lower alkyl of from 1 to 4 carbon atoms inclusive, nitro, or sulfamoyl;

R_3 is selected from hydrogen, halogen, cyclohexyl or lower alkyl of 1 to 4 carbon atoms inclusive; and

A is selected from lower alkyl of 1 to 3 carbon atoms inclusive, phenyl or benzyl.

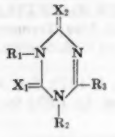
3,855,219

1,3,5-TRIAZINEDIONES

Julius Jakob Fuchs, Wilmington, and Kang Lin, Newark, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

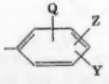
Continuation-in-part of Ser. No. 268,767, July 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 181,202, Sept. 16, 1971, abandoned. This application Oct. 30, 1972, Ser. No. 301,853
Int. Cl. C07d 55/50
U.S. Cl. 260—248 NS **19 Claims**

1. A compound of the formula



wherein

R_1 is alkyl of 1 through 8 carbon atoms, cycloalkyl of 3 through 8 carbon atoms, cycloalkylalkyl of 4 through 7 carbon atoms, alkenyl of 3 through 4 carbon atoms, alkynyl of 3 through 4 carbon atoms, benzyl or



where

Y is hydrogen, halogen, alkyl of 1 through 4 carbon atoms, nitro, alkoxy of 1 through 4 carbon atoms, alkylthio of 1 through 4 carbon atoms, cyano or trifluoromethyl, and

Z is hydrogen, halogen, methyl, ethyl, nitro, alkoxy of 1 through 4 carbon atoms, or alkylthio of 1 through 4 carbon atoms; and

Q is hydrogen, halogen or methyl;
R_2 is hydrogen, or a group

where A is alkyl of 1 through 3 carbon atoms or alkoxy or alkylthio of 1 through 4 carbon atoms, or a cation selected from lithium, sodium, potassium, calcium, magnesium, barium, or

where

R_5, R_6 and R_7 can be the same or different and each can be hydrogen, alkyl of 1 through 4 carbon atoms, or hydroxy alkyl of 2 through 4 carbon atoms; and R_8 is hydrogen, alkyl of 1 through 12 carbon atoms, or benzyl; R_5 and R_6 can be taken together to form a ring that is $-(CH_2)_2-O-(CH_2)_2-$ or $-(CH_2)_n-$ where n is 4-6 and R_7 and R_8 are H;

R_3 is SR_4 or OR_4 where

R_4 is alkyl of 1 through 6 carbon atoms, cycloalkyl of 3 through 6 carbon atoms, alkenyl of 3 through 4 carbon atoms, alkynyl of 3 through 4 carbon atoms, or benzyl, and

X_1 and X_2 are oxygen or sulfur.

3,855,220

PYRIDYLIUM-S-TRIAZINES

Hans Peter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

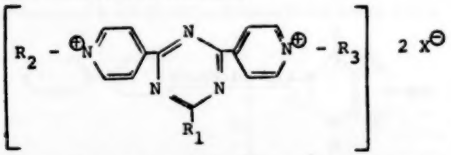
Filed Dec. 20, 1972, Ser. No. 316,948

Claims priority, application Switzerland, Dec. 22, 1971, 18819/71

Int. Cl. C07d *55/18, 55/50*

U.S. Cl. 260—248 CS **13 Claims**

1. A compound of the formula



in which R_1 is hydrogen, alkyl of from one to eight carbon atoms, haloalkyl of from one to four carbon atoms, NH_2, OH, phenyl, 4-pyridyl or N'-methyl-4-pyridylium; each of R_2 and R_3 independently represents alkyl of from one to eight carbon atoms, alkenyl of from three to seven carbon atoms, haloalkyl of from one to four carbon atoms, alkoxy of from one to four carbon atoms, alkylthio of from one to four carbon atoms, cyano or alkoxycarbonyl in which the alkoxy moiety has from one to four carbon atoms; and X^- is the anion of an acid selected from the group consisting of hydrochloric, hydrobromic, hydroiodic, phosphoric, thiophosphoric, sulphuric, fluoroboric, perchloric, methylsulphuric, ethylsulphuric, benzenesulphonic, p-toluenesulphonic, naphthoic, benzoic, halobenzoic, acetic, haloacetic, aminoacetic, propionic, halopropionic, butyric, lactic, stearic, oxalic, tartaric and fluorosulphuric.

3,855,221

HYDROXYPHENYL HYDROXYETHYLAMINOALKYL THEOPHYLLINES

Karl-Heinz Klingler, Langen, Germany, assignor to Deutsche Gold- und Silber-Schiedeanstalt Vormals Roessler, Frankfurt, Germany

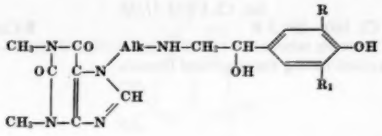
Filed Aug. 30, 1972, Ser. No. 284,911

Claims priority, application Austria, Sept. 6, 1971, 7745/71

Int. Cl. C07d *51/48*

U.S. Cl. 260—256 **14 Claims**

1. A compound having the formula



where R is methyl or hydroxymethyl, R_1 is hydrogen or methyl, Alk is a group having the formula

where R_5, R_6, R_7, R_8, R_9 and R_{10} are hydrogen or alkyl groups with one to three carbon atoms or a pharmacologically acceptable salt thereof.

3,855,222

2,4-DIAMINO-5-(3,45-TRIMETHOXYBENZYL)-6-ARYLSULFONYLPYRIMIDINES

Berislav Gluncic, and Krunoslav Kovacevic, both of Zagreb, Yugoslavia, assignors to Pliva Pharmaceutical and Chemical Works, Zagreb, Yugoslavia

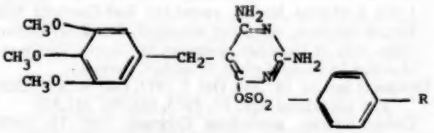
Filed Sept. 21, 1972, Ser. No. 290,839

Claims priority, application Yugoslavia, Oct. 4, 1971, 2501/71

Int. Cl. C07d *51/42*

U.S. Cl. 260—256.5 R **1 Claim**

1. 2,4-Diamino-5-(3,4,5-trimethoxybenzyl)-6-arylsulphoryloxypyrimidines of the formula:



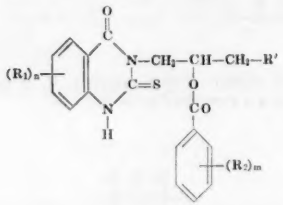
wherein R is a radical of the group consisting of H, CH_3, Cl, Br, $NHCOCH_3$, and $NHCOCH_2CH_3$.

3,855,223
BASICALLY SUBSTITUTED (1H,3H)-QUINAZOLINE-2-THION-4-ONE DERIVATIVES

Rudi Beyerle, Bruchkobel, Germany; Adolf Stachel, deceased, late of Offenbach, Germany (by Ingeburg Lydia Katharina Stachel, executrix); Rolf-Eberhard Nitz, Bergen-Enkheim, and Josef Scholtholt, Frankfurt-Fechenheim, both of Germany, assignors to Cassella Farbweke Mainkur Aktiengesellschaft, Frankfurt, Germany

Division of Ser. No. 187,562, Oct. 7, 1971, Pat. No. 3,455,223.
This application Apr. 17, 1973, Ser. No. 351,830
Claims priority, application Germany, Oct. 15, 1970, 2050640
Int. Cl. C07d 51/48
U.S. Cl. 260—256.5 R 8 Claims

1. Basically substituted (1H,3H)-quinazoline-2-thion-4-one derivatives having the structural formula



wherein

R′ is a radical selected from the group consisting of N,N-dilower-alkylamino, N-lower alkyl-N-allyl-amino, and N-lower alkyl-N-benzylamino, lower alkyl meaning alkyl having 1–4 carbon atoms;

R_1 is an alkoxy group having 1–4 carbon atoms attached to positions 6,7 or 6,7,8;

R_2 is an alkoxy group having 1–4 carbon atoms;

m is an integer selected from the group consisting of 1,2 and 3;

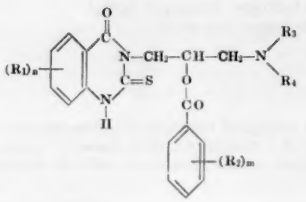
n is an integer selected from the group consisting of 2 and 3; or the pharmaceutically acceptable salts thereof.

3,855,224
BASICALLY SUBSTITUTED (1H,3H)-QUINAZOLINE-2-THION-4-ONE DERIVATIVES

Rudi Beyerle, Bruchkobel, Germany; Adolf Stachel, deceased, late of Frankfurt-Fechenheim, Germany (by Ingelburg Lydia Katharina Stachel, executrix); Rolf-Eberhard Nitz, Bergen-Enkheim, and Josef Scholtholt, Frankfurt-Fechenheim, both of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt, Germany

Division of Ser. No. 187,562, Oct. 7, 1971, Pat. No. 3,793,320.
This application Apr. 17, 1973, Ser. No. 351,831
Claims priority, application Germany, Oct. 15, 1970, 2050640
Int. Cl. C07d 51/48
U.S. Cl. 260—256.5 R 4 Claims

1. Basically substituted (1H,3H)-quinazoline-2-thion-4-one derivatives having the structural formula



wherein

R_1 is an alkoxy group having 1 – 4 carbon atoms attached to positions 6,7 or 6,7,8;

R_2 is an alkoxy group having 1 – 4 carbon atoms;

R_3 is an alkyl group having 1 – 4 carbon atoms;

R_4 is a cycloalkyl group having 4 – 6 carbon atoms;

m is an integer selected from the group consisting of 1,2 and 3;

n is an integer selected from the group consisting of 2 and 3;

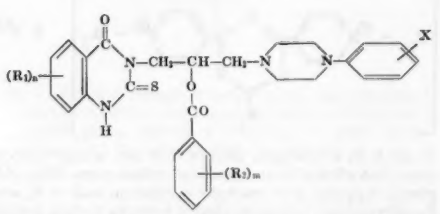
or the pharmaceutically acceptable salts thereof.

3,855,225
BASICALLY SUBSTITUTED (1H,3H)-QUINAZOLINE-2-THION-4-ONE DERIVATIVES

Rudi Beyerle, Bruchkobel, Germany; Adolf Stachel, deceased, late of Offenbach, Germany (by Ingeburg Lydia Katharina Stachel, executrix); Rolf-Eberhard Nitz, Bergen-Enkheim, and Josef Scholtholt, Frankfurt-Fechenheim, both of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt, Germany

Division of Ser. No. 187,562, Oct. 7, 1971, Pat. No. 3,793,320.
This application Apr. 17, 1973, Ser. No. 351,832
Claims priority, application Germany, Oct. 15, 1970, 2050640
Int. Cl. C07d 51/48
U.S. Cl. 260—256.5 R 5 Claims

1. A compound of the structural formula



wherein

R_1 is an alkoxy group having 1 – 4 carbon atoms attached to position 6,7 or 6,7,8;

R_2 is an alkoxy group having 1 – 4 carbon atoms;

X stands for a radical selected from the group consisting of 4-chloro and 3,4-dimethoxy;

m is an integer selected from the group consisting of 1, 2 and 3;

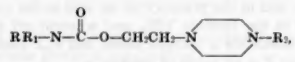
n is an integer selected from the group consisting of 2 and 3 or the pharmaceutically acceptable salts thereof.

3,855,226
PROCESS OF PREPARING NOVEL PIPERAZINYLETHYL CARBAMATES

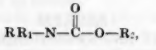
Franklin W. Abbate, North Haven, and William J. Farrissey, Jr., Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 15,878, March 2, 1970, Pat. No. 3,721,674. This application Dec. 22, 1972, Ser. No. 317,607
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 R 2 Claims

1. A process for preparing a compound of the formula:



wherein R is selected from the group consisting of methyl, ethyl, n-propyl and n-butyl, R_1 is phenyl and R_2 is selected from the group consisting of methyl and ethyl; which comprises the step of reacting a carbamate of the formula:



wherein R,R_1 and R_2 are as hereinbefore defined, with triethylenediamine at a temperature of about 80° C. to about 250° C. in the presence of an inert solvent which is a liquid at room temperature.

3,855,227
(−)-DI-O-ISOPROPYLIDENE-2-KETO-L-GULONATES

Charles William Den Hollander, 116 Maltbie Ave., Midland Park, N.J. 07432; Willy Leimgruber, 166 Highland Ave., Montclair, N.J. 07042, and Ernest Mohacsi, 640 Franklin Ave., Nutley, N.J. 07110

Filed May 8, 1972, Ser. No. 251,134
Int. Cl. C07d *35/32*
U.S. Cl. 260—286 R 4 Claims

1. A (−)-di-O-isopropylidene-2-keto-L-gulonate salt of an amine selected from the group consisting of isoquinoline or hydroisoquinoline each of which may be substituted by a substituent selected from the group consisting of methoxy, phenyl or p-methoxybenzyl, said amine having at least one chiral center as part of the ring system and whose endocyclic amino group is not directly substituted by the phenyl moiety.

3,855,228
3,4-DIHYDRO-1-OR 3-(POLYFLUOROALKYL)-2(1H)-ISOQUINOLINECARBOXAMIDOXIMES

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Aug. 21, 1972, Ser. No. 282,266
Int. Cl. C07d *35/10*
U.S. Cl. 260—288 R 4 Claims

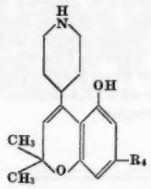
1. A compound selected from the group consisting of 3,4-dihydro-1-(pentafluoroethyl)-2(1H)-isoquinolinecarboxamidoxime, 1-(heptafluoropropyl)-3,4-dihydro-2(1H)-isoquinolinecarboxamidoxime and 3,4-dihydro-3-(trifluoromethyl)-2(1H)-isoquinolinecarboxamidoxime.

3,855,229
BENZOPYRAN-5-OLS

Raj K. Razdan, 76 Lawrence Ln., Belmont, Mass. 02178, and William R. Thompson, 77 Sacramento St., Somerville, Mass. 02143

Continuation of Ser. No. 164,145, July 19, 1971, abandoned. This application Feb. 28, 1973, Ser. No. 336,877
Int. Cl. C07d *29/16*
U.S. Cl. 260—293.58 3 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R_4 is n-pentyl, n-hexyl, n-heptyl, n-nonyl, 2-heptyl, 3-methyl-2-octyl, 2-nonyl, decyl, dodecyl, 2-tetradecyl, n-hexadecyl or 2-eicosanyl.

3,855,230
2-(3'-TRIFLUOROMETHYLTHIO-ANILINO)-BENZOIC ACID AND SALTS THEREOF WITH PHARMACEUTICALLY ACCEPTABLE BASES

Henry Najer, and Jean-Francois Giudicelli, both of Paris, France, assignors to Synthelabo, Paris, France

Filed July 17, 1972, Ser. No. 272,141
Claims priority, application France, July 15, 1971, 71.25856
Int. Cl. C07d *31/34*
U.S. Cl. 260—294.8 G 2 Claims

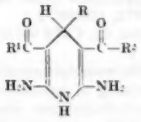
1. 2-(3'-trifluoromethylthio-anilino)-benzoic acid and salts which it forms with pharmaceutically acceptable bases.

3,855,231
2,6-DIAMINO-1,4-DIHYDROPYRIDINE DERIVATIVES

Horst Meyer; Friedrich Bossert, both of Wuppertal-Elberfeld; Wulf Vater, Opladen, and Kurt Stoepel, Wuppertal-Vohwinkel, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 28, 1973, Ser. No. 336,483
Claims priority, application Germany, Mar. 6, 1972, 2210687
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 G 22 Claims

1. A compound of the formula



wherein

R is hydrogen; lower alkyl; alkenyl of 2 to 4 carbon atoms; alkynyl of 2 to 4, carbon atoms phenyl; substituted phenyl in which the substituents are one to three members selected from the group consisting of lower alkyl, lower alkoxy, halogeno, nitro, cyano, trifluoromethyl, azido, carbo(lower alkoxy), lower alkylsulfonyl, lower alkylsulfinyl, lower alkylthio or phenyl; or naphthyl; and

each of R^1 and R^2, taken independently of the other, is, lower alkoxy, lower alkoxy)lower alkoxy), alkenyloxy of 2 to 4 carbon atoms, alkynyloxy of 2 to 4 carbon atoms, amino, lower alkylamino or di(lower alkyl)amino.

3,855,232
PREPARATION OF 1-(LOWER-ALKYL)-1,4-DIHYDRO-7-ETHYL-4-OXO-1,8-NAPHTHYRIDINE-3-CARBOXYLATE

R. Pauline Brundage, and George Y. Lesher, Shodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 263,788, June 19, 1972, Pat. No. 3,786,043. This application June 8, 1973, Ser. No. 368,455
Int. Cl. C07d *31/36*
U.S. Cl. 260—295.5 B 5 Claims

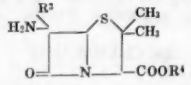
1. The process consisting essentially of heating at about 70°–250°C. in the absence or presence of a suitable solvent inert under the reaction conditions, where the solvent is selected from a polar, dipolar aprotic, and non-polar solvent, lower-alkyl 4-chloro-7-methyl-1,8-naphthyridine-3-carboxylate with alkali metal lower-alkoxide to produce lower-alkyl 1-(lower-alkyl)-1,4-dihydro-7-methyl-4-oxo-1,8-naphthyridine-3-carboxylate.

3,855,233
6-SUBSTITUTED PENICILLANIC ACID AND DERIVATIVES THEREOF

Joseph Edward Dolfini, Princeton; Ekkehard Bohme, Hightstown, and William A. Slusarchyk, Belle Mead, all of N.J., assignors to E. R. Squibb and Sons, Inc., Princeton, N.J.

Filed Sept. 24, 1971, Ser. No. 183,642
Int. Cl. C07d *99/14*
U.S. Cl. 260—306.7 C 3 Claims

1. A compound having the formula:



where R^3 is lower alkylthio; and R^4 is selected from the group consisting of hydrogen, lower alkyl, trimethylsilyl, benzyl, benzhydryl, methoxybenzyl, and trichloroethyl; and pharmaceutically acceptable salts thereof.

3,855,234
MANUFACTURE OF TETRAMISOLE

Thomas Paterson Roy, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

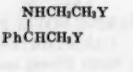
Filed June 12, 1972, Ser. No. 261,992
Claims priority, application Great Britain, July 9, 1971, 32330/71; Apr. 6, 1972, 15849/72
Int. Cl. C07d *99/10*
U.S. Cl. 260—306.7 T 11 Claims

1. In a process for the manufacture of a compound selected from the group consisting of tetramisole and 2-imino-3-(2-hydroxy-2-phenylethyl)-thiazolidine and acid-addition salts thereof, and involving the conversion of a compound of the formula:

$$PhCHOHCH_2NHCH_2CH_2Y \qquad IX$$

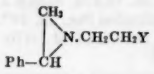
into the said 2-imino-thiazolidine derivative or an acid-addition salt thereof, and the optional conversion of the said 2-imino-thiazolidine derivative or an acid-addition salt thereof into tetramisole or an acid-addition salt thereof, the step which comprises reacting a compound which is selected from the group consisting of ethylamine derivatives of the formulae: $PhCHYCH_2NHCH_2CH_2Y \; H_nZ$ V

and



VII

and



VIII

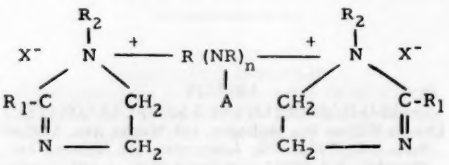
with water, and in the presence of an acid in the case of the compound of the formula VIII,, and wherein pH stands for phenyl, Y stands for a halogen atom, and H_nZ stands for an acid wherein Z is an anion of valency *n*.

3,855,235
QUATERNARY AMMONIUM DERIVATIVES OF BISIMIDAZOLINE COMPOUNDS

Robert B. McConnell, Janesville, Wis., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed July 16, 1973, Ser. No. 379,574
Int. Cl. C07d *49/34*
U.S. Cl. 260—309.6 14 Claims

1. A quaternary ammonium compound having the formula:



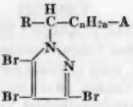
wherein R_1 is a $C_5 - C_{23}$ hydrocarbyl group; n is an integer of from 0–4; R_2 is lower alkyl; R is a $C_2 - C_4$ alkylene group; A represents hydrogen or an acyl group of the formula $R_1C(O)-$ in which R_1 has the meaning as aforesaid; and X represents a chloro or a lower alkyl sulfate anion.

3,855,236
MULTI-STEP PROCESS FOR PREPARING 1-(SUBSTITUTED-HYDROCARBYL)-3,4,5-TRIBROMOPYRAZOLES

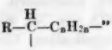
Gabriel Kornis, and Eldon G. Nidy, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 23, 1972, Ser. No. 228,770
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 R 17 Claims

1. The process which comprises reacting a mineral acid addition salt of hydrazine hydrate with 1,1,3,3-tetraalkoxypropane in a substantially aqueous medium to obtain a corresponding aqueous reaction mixture comprising pyrazole; reacting the pyrazole thus produced in situ with bromine in the presence of aqueous alkali metal hydroxide until bromination is complete and 3,4,5-tribromopyrazole is obtained; reacting the said tribromo product, in situ, with an α, β, γ, or Δ-monohalogenated alkanoamide or -alkanoic acid in the presence of substantially equivalent amounts of an alkali metal hydroxide, and thence recovering the desired 1-(substituted-hydrocarbyl)-3,4,5-tribromopyrazole of the formula:



wherein *n* is an integer 0, 1, 2, or 3; R is hydrogen, alkyl of from 1 to 5 carbon atoms, inclusive, the sum of carbon atoms in the group



being not more than 9; and A is the carboxyl group or a carboxylic amide group of the formula

wherein R_1 and R_2 are hydrogen atoms or substituent groups more fully described as follows:

Individually, R_1 and R_2 are lower-alkyl of from 1 to 8 carbon atoms, inclusive; alkenyl of from 3 to 8 carbon atoms, inclusive; alkynyl of from 3 to 8 carbon atoms, inclusive; aralkyl of from 7 to 13 carbon atoms, inclusive; aryl of from 6 to 10 carbon atoms, inclusive (provided both R_1 and R_2 are not aryl at the same time); cycloalkyl of from 3 to 8 carbon atoms, inclusive, cycloalkenyl of from 4 to 8 carbon atoms, inclusive; cycloalkenyl of from 4 to 8 carbon atoms, inclusive; and

Collectively, the

group is a saturated heterocyclic amino group of from 3 to 7 ring atoms, inclusive, having a total of not more than 15 carbon atoms.

3,855,237

PROCESS OF MAKING HEXAHYDRO-1H-FURO(3,4-C) PYRROLE

George C. Gatos, Wilmington, Del., assignor to ICI America Inc., Wilmington, Del.

Filed June 14, 1973, Ser. No. 370,009
Int. Cl. C07d *59/00*
U.S. Cl. 260—326.8 **3 Claims**

1. A process of making hexahydro-1H-furo(3,4-c)pyrrole comprising (a) reacting 3,4-bis(hydroxymethyl)furan with a ketone or aldehyde to form 3,4-bis (hydroxymethyl)furan-ketal or -acetal or reacting 3,4-bis(hydroxymethyl)furan with a low molecular weight ketal or acetal by a ketal or acetal interchange reaction to form the corresponding 3,4-bis(hydroxymethyl)furan-ketal or -acetal; (b) hydrogenating the product of step (a) to form the corresponding cis 3,4-bis(hydroxymethyl)tetrahydrofuran-ketal or -acetal; (c) hydrolyzing the product of step (b) to form cis 3,4-bis(hydroxymethyl)tetrahydrofuran; (d) reacting the product of step (c) with a compound so as to replace the two hydroxyl groups of the product of step (c) with two groups selected from the group consisting of sulfonyl groups or halogens; and then (e) reacting the product of step (d) with ammonia to yield the named product or reacting the product of step (d) with an alkylamine or aralkylamine to form the corresponding cyclized product which in turn is dealkylated or dearalkylated yield the named product.

3,855,238

PROCESS FOR PREPARING N-TERTIARY-BUTOXYCARBONYL AMINO ACIDS

Donald C. Batesky, and William C. Schultz, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 80,797, Oct. 14, 1970, abandoned. This application June 28, 1971, Ser. No. 157,606
Int. Cl. C07d *27/60*
U.S. Cl. 260—326.14 T **20 Claims**

1. A process for preparing an N-tertiarybutoxycarbonyl amino acid which comprises the step of reacting a base addition salt of an amino acid with O-tertiary-butyl S-phenyl thiocarbonate to form thereby the corresponding N-tertiarybutoxycarbonyl amino acid.

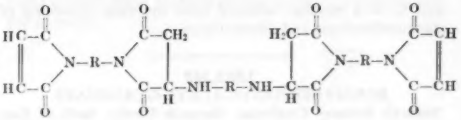
3,855,239

POLYIMIDES

James V. Crivello, Mechanicville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 163,410, July 16, 1971, Pat. No. 3,766,138. This application Jan. 19, 1973, Ser. No. 325,065
Int. Cl. C07d *27/18*
U.S. Cl. 260—326.26 **4 Claims**

1. A composition of matter having the general formula



where the R's can be the same or different divalent organic radicals selected from the class consisting of (1) divalent saturated alkylene radicals of from 1 to 10 carbon atoms, (2) the phenylene radical and (3) divalent groups consisting of two unsubstituted phenylene radicals attached to each other through the medium of a member selected from the class consisting of an alkylene radical of from 1 to 10 carbon atoms,

and —O—.

3,855,240

SULFUR CONTAINING HETEROCYCLES

Wolfgang H. Mueller, Elizabeth, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 28, 1969, Ser. No. 819,944
Int. Cl. C07d *73/00*
U.S. Cl. 260—327 P **14 Claims**

1. A process for the preparation of heterocyclic dithianes and dithienes which comprises reacting, in the liquid phase, 1,2-disulfenyl halide with an acetylenic compound and thereafter recovering said sulfur containing heterocyclic compound.

3,855,241
ARYL KETONE CONTAINING ORGANOSILICON MATERIALS

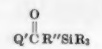
Edward V. Wilkus, Monroe, Conn., and Abe Berger, Schenectady, N.Y., assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 56,632, July 20, 1970, Pat. No. 3,715,370, which is a division of Ser. No. 724,300, Feb. 2, 1968, Pat. No. 3,544,595. This application Mar. 17, 1972, Ser. No. 235,811

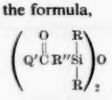
Int. Cl. C07d *63/24*

U.S. Cl. 260—329.3 **3 Claims**

1. An aryl ketone containing organosilicon compound selected from the class consisting of (A) monomers of the formula,



and (B) disiloxanes of the formula,



where R is a member selected from the class consisting of aryl of up to eight carbon atoms, haloaryl of up to eight carbon atoms, aralkyl of up to eight carbon atoms, alkyl of up to four carbon atoms, alkenyl of up to three carbon atoms, cycloalkyl of up to six carbon atoms, haloalkyl of up to four carbon atoms, cyanoalkyl of up to four carbon atoms, halo and alkoxy of up to four carbon atoms; R'' is a member selected from the class consisting of alkylene of up to 10 carbon atoms, haloalkylene of up to 10 carbon atoms, arylene of up to seven carbon atoms and haloarylene of up to seven carbon atoms; and Q' is a member selected from the class consisting of dibenzothiophene and dibenzofuran.

3,855,242
BENZO[B]THIENYL-ALKYL-GUANIDINES

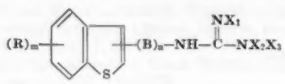
Norman Bellamy Chapman; Kenneth Clarke, both of East Yorkshire, and John William James, Buckinghamshire, all of England, assignors to Aspro-Nicholas Limited, Slough, Berkshire, England, by said James

Continuation-in-part of Ser. Nos. 157,775, June 28, 1971, abandoned, and Ser. No. 144,334, May 17, 1971, abandoned, and Ser. No. 782,003, Dec. 6, 1968, abandoned. This application Oct. 26, 1971, Ser. No. 192,320

Int. Cl. A61k *27/00;* **C07d** *63/22*

U.S. Cl. 260—330.5 **8 Claims**

1. A benzo[*b*] thiophen having the formula: v,



wherein

X_1 is selected from the group consisting of hydrogen and alkyl having from one to six carbon atoms;

X_2 is selected from the group consisting of hydrogen and alkyl having from one to six carbon atoms;

X_3 is selected from the group consisting of hydrogen and alkyl having from one to six carbon atoms, phenyl and the group $-C(:NH).NH_2$;

R is selected from the group consisting of halogen, alkyl having from one to six carbon atoms, and alkoxy having from one to six carbon atoms attached to the 3- or 5 -positions of the benzothienyl nucleus;

B is an alkylene chain having from one to four carbon atoms attached to the 2-, 3-, on 5-positions of the benzothienyl nucleus;

n is zero or one; and

m is 0, 1, or 2;

or an acid addition salt or quaternary ammonium salt thereof.

3,855,243
3-AMINOACYLAMINO THIOPHENES

Heinrich Ruschig, Bad Soden, Taunus; Manfred Schorr; Roman Muschaweck, both of Frankfurt am Main, and Robert Rippel, Hofheim, Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft Vormal Meister Lucius & Bruning, Frankfurt, Germany

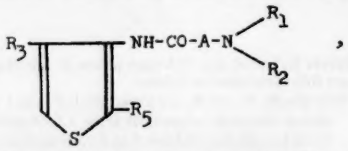
Continuation-in-part of Ser. No. 105,991, Jan. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 750,399, July 2, 1968, abandoned. This application Oct. 1, 1973, Ser. No. 402,382

Claims priority, application Germany, July 7, 1967, 1643325

Int. Cl. A61k *27/00;* **C07d** *63/16, 63/12*

U.S. Cl. 260—332.2 C **6 Claims**

1. a substituted 3-aminoacylamino-thiophene of the formula



and physiologically tolerated salts thereof, wherein R_1, taken alone, is hydrogen or alkyl having up to four carbon atoms; R_2, taken alone, is alkyl having up to four carbon atoms; R_1 and R_2, taken together with the nitrogen atom to which they are attached, are piperidino, pyrrolidino, morpholino, or N-methyl piperazino; one of R_3 and R_5 is methyl and the other is carbomethoxy or carbethoxy; and A is alkylene having one or two carbon atoms.

3,855,244
XANTHEN DERIVATIVES

Stewart Sanders Adams; Bernard John Armitage; Norman William Bristow, and Bernard Vincent Heathcote, all of 1 Thame Rd. West, Nottingham, England

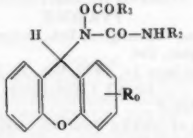
Continuation-in-part of Ser. No. 191,110, Oct. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 662,587, Aug. 23, 1967, Pat. No. 3,644,420. This application Mar. 26, 1973, Ser. No. 344,570

Claims priority, application Great Britain, Sept. 2, 1966, 39384/66; Apr. 5, 1967, 15692/67

Int. Cl. C07d *7/42*

U.S. Cl. 260—335 **8 Claims**

1. A compound of the formula



in which

R_0 is hydrogen, halogen, alkoxy or alkyl;

R_2 is hydrogen, alkyl, alkanoyloxyalkyl or alkoxyalkyl;

and

R_3 is hydrogen; alkyl containing 1–17 carbon atoms; alkyl containing a single substituent selected from alkoxy, alkylthio, phenoxy, phenyl, cycloalkyl and alkoxycarbonyl; alkenyl; cycloalkyl; alkoxycarbonyl; alkoxy; alkoxy containing a single substituent selected from alkoxy, phenoxy, cycloalkyl, alkoxycarbonyl, halogen, cyano, alkoxyalkoxy, nitro and phenyl; phenoxy; alkenyloxy; alkynyloxy or cycloalkoxy;

and

wherein the terms "alkyl," "cycloalkyl," "alkoxy," "alkylthio," "alkenyl," "alkenyloxy," "alkynyloxy," "cycloalkoxy" and "alkanoyloxy," indicate such groups containing up to seven carbon atoms (unless otherwise specified).

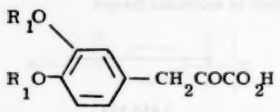
3,855,245

PROCESS FOR THE MANUFACTURE OF DERIVATIVES OF BETA-PHENYLPYRUVIC ACID

Hiroyasu Koyama, Tokyo, and Kunio Nakagawa, Kawagoe, both of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

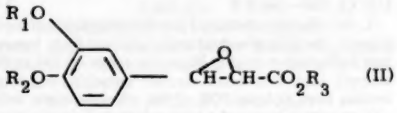
Filed May 23, 1972, Ser. No. 256,118
Claims priority, application Japan, June 16, 1971, 46-42575
Int. Cl. C07d 13/10
U.S. Cl. 260—340.5 8 Claims

1. A process for the manufacture of β-phenyl pyruvic acid represented by the formula:



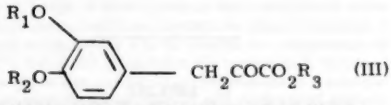
(I)

wherein R_1 and R_2 are same or are different and each is a lower alkyl having from 1 to 3 carbon atoms or R_1 and R_2 together may form methylene, characterized in that β-phenyl glicidic ester represented by the formula:



(II)

wherein R_1 and R_2 have the same meanings as above and R_3 stands for lower alkyl are rearranged by an anhydrous acid taken from the group consisting of hydrogen chloride, sulfuric acid, or a Lewis acid to form β-phenyl pyruvic ester represented by the formula:



(III)

wherein R_1, R_2 and R_3 have the same meaning as above and then the β-phenyl pyruvic ester is hydrolyzed by a concentrated hydrohalic acid to give the β-phenyl pyruvic acid.

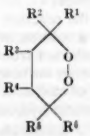
3,855,246

AKLYL-SUBSTITUTED 3,6-DIHYDRO-O-DIOXIN DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Kiyosi Kondo, Yamato; Masakatsu Matsumoto, Sagamihara, and Miyako Hatsutani, Zushi, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Dec. 19, 1972, Ser. No. 316,504
Claims priority, application Japan, Dec. 21, 1971, 46-103210; July 21, 1972, 47-72470
Int. Cl. C07d 15/00
U.S. Cl. 122—340.6 8 Claims

1. An alkyl-substituted 3,6-dihydro-o-dioxin having the formula:



wherein R^1, R^2, R^3, R^4, R^5 and R^6 may be the same or different, wherein R^1, R^2 and R^4 are hydrogen, methyl or phenyl; R^3 is hydrogen, alkyl having one to four carbon atoms or benzyl; R^5 and R^6 are hydrogen or methyl, provided that at least one of R^1 to R^6 is alkyl or benzyl.

3,855,247

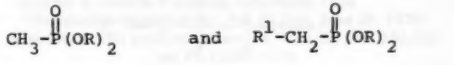
PRODUCTION OF UNSATURATED CARBOCYCLIC KETONES

John H. Fried, Palo Alto, Calif., assignor to Syntex Corporation, Panama, Panama

Division of Ser. No. 773,320, Nov. 4, 1968, Pat. No. 3,652,596, which is a continuation-in-part of Ser. Nos. 747,465, July 25, 1968, , and Ser. No. 687,502, Dec. 4, 1967, Pat. No. 3,639,428. This application Nov. 12, 1971, Ser. No. 198,476
Int. Cl. C07d 13/08
U.S. Cl. 260—340.9 10 Claims

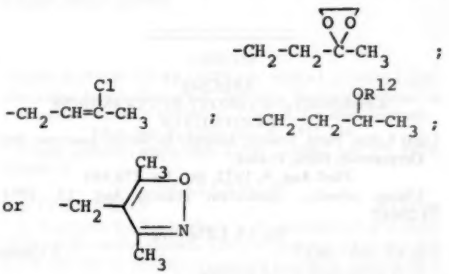
1. A process for preparing α,β-unsaturated carbocyclic ketones which comprises the steps of:

a. reacting at temperatures in the range of from −150° to −20°C under anhydrous conditions in an organic solvent, inert to the reaction, a base selected from the group consisting of alkali metal hydrides, alkali metal amides, and organo alkali metal compounds selected from the group consisting of n-butyl lithium, phenyl lithium, methyl sodium, sodium acetylide, methyl potassium, methyl lithium, tolyl lithium and methyl potassium lithium pyridide, with about an equal molar amount of a phosphonate selected from the group having the formulas:



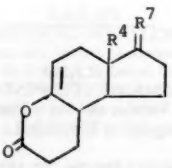
(A) and (B)

wherein R is selected from the group consisting of lower alkyl having from one to six carbon atoms, cyclohexyl, phenyl, tolyl, trichlorophenyl and benzyl, and wherein R^1 is a group having the formula:



wherein $-OR^{12}$ is an acid labile ether group selected from the group consisting of tetrahydrofuran-2′-yloxy, tetrahydropyan-2′-yloxy, t-butoxy and methoxy, thereby generating the corresponding carbanion; and

b. reacting in situ with said carbanion about an equal molar amount of an enol lactone having the formula:



wherein R^4 is methyl or ethyl and R^7 is oxo or a lower alkylenedioxy having one to six carbon atoms thereof or the group

in which R^8 is hydroxy, a carboxylic ester having less than 12 carbon atoms, or an acid labile ether selected from the group consisting of t-butoxy, tetrahydropyran-2-yloxy, tetrahydrofuran-2-yloxy, methoxy, ethoxy and methoxymethyleneoxy, thereby producing the corresponding α,β-unsaturated carbocyclic ketone.

3,855,248

DIOXOLANE POLYCARBOXYLATES

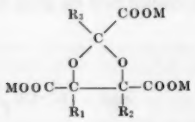
Kent P. Lannert, Freeburg, Ill., and Russel D. Harken, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed May 8, 1972, Ser. No. 251,160

Int. Cl. C07d *13/04*

U.S. Cl. 260—340.9 **4 Claims**

1. A compound represented by the formula



wherein R_1 and R_2 are selected from the group consisting of hydrogen, methyl, —COOX, and $—CH_2COOX$; R_3 is selected from the group consisting of hydrogen, methyl and —COOX; and X is selected from the group consisting of hydrogen, methyl, ethyl, alkali metal, and ammonium.

3,855,249

4-PHENOXY-3-HYDROXY-BUTYRAMIDINE DERIVATIVES

Louis Lafon, Paris, France, assignor to Societe anonyme dite: Orsymonde, Paris, France

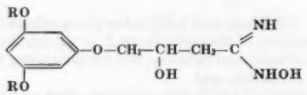
Filed Aug. 9, 1972, Ser. No. 278,944

Claims priority, application France, Aug. 13, 1971, 71.29685

Int. Cl. C07d *5/12*

U.S. Cl. 260—343.7 **3 Claims**

1. A compound of the formula



in which R represents hydrogen or alkyl of one to five carbon atoms or a salt thereof of a pharmaceutically acceptable acid.

3,855,250

CERTAIN 2-OXO-2H-CYCLOPENTA (B)-FURANS

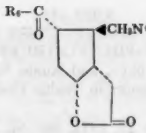
Jane Liu Jernow, Verona, and Perry Rosen, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 317,589, Dec. 22, 1972, abandoned. This application Apr. 3, 1974, Ser. No. 457,528

Int. Cl. C07d *5/06*

U.S. Cl. 260—343.3 **3 Claims**

1. A compound of the formula:



wherein R_6 is methyl or halogen;
or enantiomers or racemates thereof.

3,855,251

ALKENYL-SUBSTITUTED SUCCINIC ANHYDRIDE

Paul J. Cahill, Lombard, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Dec. 22, 1972, Ser. No. 317,671

Int. Cl. C07c *55/10*

U.S. Cl. 260—346.8 R **3 Claims**

1. An alkenyl-substituted succinic anhydride composition, wherein the alkenyl-substituent is derived from butene polymer hydrocarbon having M_n in the range of 200 to 900 and wherein such substituted succinic anhydride the molecular entities have at least 50% of the alkenylsuccinic anhydride adduct isomer having the tetra-substituted double bond illustrated in the formula $(CH_3)_2C{=}C(R)P—SA$ wherein R is the branched hydrocarbon chain of the butylene polymer whose back-bone chain comprises repeating butyl units and whose side chains are either butyl or repeating butyl units and wherein SA is the succinic anhydride ring.

3,855,252

LIQUID PHASE OXIDATION OF CONDENSED-RING AROMATIC HYDROCARBONS

Kenneth R. Robinson, Russell, and Joseph E. Willis, Ashland, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation of Ser. No. 744,768, July 15, 1968, abandoned. This application Sept. 15, 1971, Ser. No. 180,228

Int. Cl. C07c *49/68*

U.S. Cl. 260—385 **9 Claims**

1. A method for producing anthraquinone from a mixture of aromatic hydrocarbons boiling between about **630°F** and about **680°F** and consisting essentially of phenanthrene and anthracene comprising:

a. oxidizing with molecular oxygen the anthracene in said hydrocarbon mixture to anthraquinone by contacting said hydrocarbon mixture with a molecular oxygen-containing gas and a catalyst consisting essentially of manganese acetate, cobalt acetate or a combination of manganese acetate and cobalt acetate, and optionally a bromine compound selected from the group consisting of bromine and potassium bromide;

b. while maintaining the reaction mixture in a liquid phase by adding thereto a solvent medium, at least a part of which is an acid selected from the group consisting of mineral acids and lower carboxylic acids wherein at least one part by weight of said acid per part of anthracene in the mixture of aromatic hydrocarbons is utilized;

c. while maintaining a temperature between about 155°F and about 380°F and a pressure between about atmospheric and about 800 psig, said temperature and pressure being mutually adjusted to maintain said reaction mixture in a liquid phase and;

d. separating anthraquinone from the reaction product formed.

3,855,253

4'-[(DIIODOMETHYL)SULFONYL] ACETANILIDE

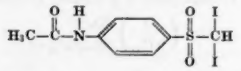
Aldo Joseph Crovetti, Lake Forest, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 215,949, Dec. 16, 1971, abandoned, which is a division of Ser. No. 805,846, March 10, 1969, Pat. No. 3,632,859. This application Aug. 7, 1973, Ser. No. 386,233

Int. Cl. C07c *147/00*

U.S. Cl. 260—397.6 1 Claim

1. A compound of the formula



3,855,254

INTERESTERIFICATION PROCESS

Adolf Johan Haighton, and Hans Robert Kattenberg, both of Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 31, 1972, Ser. No. 240,240

Int. Cl. C11c *3/10*; A23d *3/02*

U.S. Cl. 260—410.7 7 Claims

1. Process for accelerating the directed interesterification reaction of a mixture of glycerides containing fatty acid radicals with 2 to 26 carbon atoms, in which the reaction is carried out at temperatures from −30° to 60°C in the presence of 0.01 to 0.5% by weight of alkali metals or their catalytically active derivatives under conditions at which the glyceride mixture is alternately subjected for 5 to 60 minutes to a temperature of 1° to 15°C below the cloud point of a randomized mixture of the same glycerides and for 15 to 300 minutes to a temperature of at least the cloud point of said randomized mixture, whereby the temperature is cycled at least three times until the cloud point of the mixture obtained is at least 5°C above the cloud point of the randomized mixture.

3,855,255

PROCESS FOR THE PRODUCTION OF HIGHER, POLYUNSATURATED CARBOXYLIC ACID ESTER AND FREE ACIDS

Manfred Dohr, Dusseldorf-Holthausen; Helmut Singer, Dusseldorf-Wersten, and Wilfried Umbach, Langenfeld, all of Germany, assignors to Henkel and Cie GmbH, Dusseldorf, Germany

Filed May 25, 1971, Ser. No. 146,780

Claims priority, application Germany, May 27, 1970, 2025830

Int. Cl. C07c *67/00*

U.S. Cl. 260—410.9 R 12 Claims

1. In the process for the preparation of higher, polyunsaturated carboxylic acid esters comprising the steps of reacting a conjugated diolefin with a lower alkyl methacrylate in a ratio of at least 4 mols of diolefin per mol of methacrylate, in the presence of an organo-metal complex of zero-valent nickel and of an electron donor, and recovering a higher, polyunsaturated carboxylic acid ester having more than 19 carbon atoms in the acid moiety, the improvement consisting of employing an electron donor selected from the group consisting of phosphorous acid triamides, morpholine, N-methylmorpholine, piperidine, pyridine, the picolines, collidine, quinoline, pyrrole, aliphatic sulfides, triaryl-arsines and triaryl-stibines.

3,855,256

OIL OF TEMPEH

Paul Gyorgy, 201 Curwen Rd., Rosemont, Pa. 19010

Division of Ser. No. 155,252, June 21, 1971, Pat. No. 3,762,933. This application June 27, 1973, Ser. No. 374,074

Int. Cl. C11b *1/10*

U.S. Cl. 260—412.8 1 Claim

1. Oil of tempeh useful as an antioxidant or stabilizing agent for edible oils and fats prepared by extracting tempeh, a fermented soybean product, with a liquid solvent consisting essentially of a low molecular weight aliphatic hydrocarbon, said aliphatic hydrocarbon containing four to 12 carbon atoms per molecule, and a low molecular weight oxygen-containing polar aliphatic organic compound, said polar organic compound containing from one to 10 carbon atoms per molecule, recovering the resulting liquid solvent extract phase and separating therefrom the solvent consisting essentially of said aliphatic hydrocarbon and polar organic compound to produce said oil of tempeh.

3,855,257

PREPARATION OF CARBOXYLIC ACIDS BY THE OXIDATION OF VICINAL GLYCOLS

Edmund P. Pultinas, Jr., Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 51,023, June 29, 1970, abandoned. This application June 23, 1971, Ser. No. 156,053

Int. Cl. C08h *17/36*

U.S. Cl. 260—413 8 Claims

1. A process for preparing carboxylic acids comprising oxidizing an internal vicinal glycol in the presence of a catalytic amount of a mixture comprising a cobalt (II) salt of an organic acid and a compound selected from the group consisting of peroxidized tungstic acid, peroxidized tungstic oxide, peroxidized molybdic acid and peroxidized molybdic oxide in a polar, aprotic solvent.

3,855,258

PREPARATION OF TRANSITION METAL COMPLEXES

Alexander Joseph Peter Pioli, Runcorn, England, assignor to Imperial Chemical Industries, Limited, London, England

Filed July 6, 1973, Ser. No. 377,104

Claims priority, application Great Britain, July 13, 1972, 32808/72

Int. Cl. C07f *7/00*

U.S. Cl. 260—429.3 5 Claims

1. A process for the production of a tetrabenzyl of a metal of Group IVa of the Periodic Table by reaction of a Group IVa metal salt with an ethereal solution of a benzylic compound of magnesium in which, after completion of the reaction, the ethereal solution is treated with a liquid hydrocarbon which is miscible with the ether, is a solvent for the product tetrabenzyl and is a non-solvent for the magnesium compounds present in the reaction system and has a boiling point at least 50°C higher than that of the ether, the process being performed under substantially dry, oxygen-free conditions and the ether being subsequently removed by stripping or distillation.

3,855,259

METHOD OF PREPARING PHENYLCHLOROSILANES

Minoru Takamizawa, and Mitsuo Umemura, both of Annaka, Japan, assignors to Shinetsu Chemical Company

Filed Feb. 21, 1973, Ser. No. 334,277

Claims priority, application Japan, Feb. 23, 1972, 47-18665

Int. Cl. C07f *7/16*

U.S. Cl. 260—448.2 T 9 Claims

1. Method of preparing phenylchlorosilanes which comprises contact-reacting chlorobenzene with a mass composed of metallic silicon and a catalyst comprising a major portion of copper and a minor portion of an iron oxide in an amount of from about 0.5 percent to about 5 percent by weight based

on the weight of said mass at a temperature in the range of from about 400° to about 500°C.

3,855,260

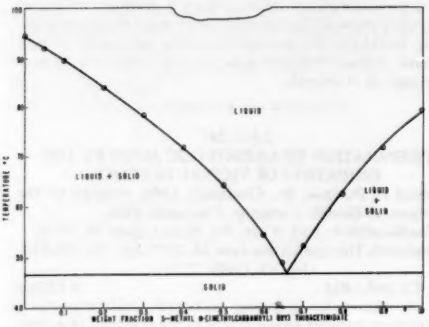
MELT PREPARATION OF S-METHYL N-[(METHYL-CARBAMOLY)OXY]THIOACETIMIDATE

Robert J. Vollkommer, Claymont, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1972, Ser. No. 317,803

Int. Cl. C07c *119/16*

U.S. Cl. 260—453 R **8 Claims**



1. In the method of making S-methyl N-[(methylcarbamoyl)oxy]thioacetimidate by reacting methylisocyanate with S-methyl N-hydroxythioacetimidate in the absence of solvent, the improvement which comprises contacting the reactants under conditions such that for at least a terminal portion of the reaction the reaction mass is maintained as a continuous liquid phase.

3,855,261

(HYDROCARBONTHIO)OXAMIDE VULCANIZATION RETARDERS

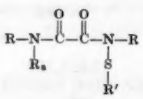
Pyong-Nae Son, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Division of Ser. No. 238,653, March 27, 1972, Pat. No. 3,780,001. This application July 30, 1973, Ser. No. 383,770

Int. Cl. C07c *119/118*

U.S. Cl. 260—453 R **7 Claims**

1. (Hydrocarbonthio)oxamides of the formula



wherein R is selected from the group consisting of hydrogen, alkyl radicals containing 1 to 18 carbon atoms, and a phenyl radical, Ra is the same as R or is a —SR′ radical, and R′ is hydrocarbon radical selected from the group consisting of alkyl radicals containing 1 to 18 carbon atoms, cyclobutyl, cyclopentyl, cyclohexyl, cyclooctyl, and phenyl radicals.

3,855,262

N-(HYDROCARBYLTHIO) AMIDES

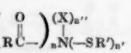
Aubert Yaucher Coran, and Joseph Edward Kerwood, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 208,447, Dec. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 29,717, March 27, 1970, Pat. No. 3,752,824, which is a division of Ser. No. 714,445, March 20, 1968, Pat. No. 3,546,185. This application Sept. 6, 1973, Ser. No. 394,558

Int. Cl. C07c *119/18, 119/20*

U.S. Cl. 260—453 R **16 Claims**

1. A compound of the formula



where *n*, *n′* and *n″* are integers, the sum of which is three, *n* and *n′* being one or two, and *n″* being zero or one, R is lower alkyl or phenyl, R′ is hydrocarbyl which is phenyl, benzyl or cycloalkyl of 5–8 carbon atoms and X is hydrogen or R.

3,855,263

TETRAHYDRO-2-NAPHTHYL ESTER DERIVATIVES OF TINONOCARBANILIC ACIDS

Piero Melloni; Raffaella Metelli; Vittorio Vecchietti; Willy Logeman; Ivo De Carneri; Silvana Castellino, and Gisella Monti, all of Milan, Italy, assignors to Carlo Erba S.p.A., Milan, Italy

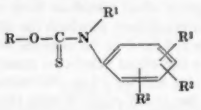
Filed Mar. 13, 1973, Ser. No. 340,932

Claims priority, application Italy, Mar. 20, 1972, 22102/72

Int. Cl. C07c *155/00*

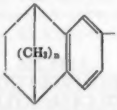
U.S. Cl. 260—455 A **34 Claims**

1. A compound of general formula (I)



I

wherein R is a 5,6,7,8-tetrahydro-2-naphthyl group or a group of general formula



wherein n is 1, 2 or 3; R^1 is a hydrogen atom or a C_{1-6} alkyl group; and each of the groups R^2 which may be the same or different, is a hydrogen or halogen atom, a nitro, cyano, trihalomethyl, phenyl, C_{1-6} alkyl or C_{1-6} alkoxy group or a group of formula $—SR^3$, $—COR^3$ or $—NHCOR^3$ wherein R^3 is a C_{1-6} alkyl group.

3,855,264

PREPARATION OF HALOGENATED BENZONITRILE

Lewis William Watts, Jr.; Ernest Leon Yeakey, and Philip Hotchkiss Moss, all of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed May 18, 1970, Ser. No. 38,478

Int. Cl. C07c *121/52*

U.S. Cl. 260—465 G **3 Claims**

1. A process for preparing chlorinated benzonitrile by reacting in a vapor phase chlorine and benzonitrile or partially chlorinated derivatives of benzonitrile, which comprises:

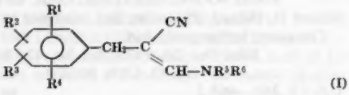
contacting the chlorine with the benzonitrile in an open tubular reactor heated to a temperature of from about 650°C. to about 850°C.

3,855,265
5-BENZYL PYRIMIDINES INTERMEDIATES THEREFORE, AND METHOD

Ronald M. Cresswell, Raleigh; John W. Mentha, Washington, and Russell L. Seaman, Chapel Hill, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

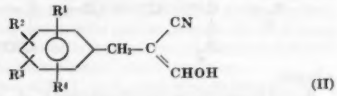
Division of Ser. No. 16,606, March 4, 1970, Pat. No. 3,697,512. This application July 25, 1972, Ser. No. 274,855
Claims priority, application Great Britain, Mar. 6, 1969, 11908/69; Mar. 6, 1969, 11909/69; May 16, 1969, 25171/69; June 13, 1969, 30247/69
Int. Cl. C07c *121/42*
U.S. Cl. 260—465 E 4 Claims

1. In the method of preparing a compound of the formula I



(I)

the step of combining the compound of the formula II



(II)

and aniline and permitting them to react, in the above formulas R^1–R^4 are the same or different and each is a hydrogen or halogen atom, loweralkyl, lowerakloxy or benzyloxy, or R^3 and R^4 taken together may be a methylenedioxy group when both R^1 and R^2 are hydrogen atoms, and NR^5H^6 is anilino in Formula I.

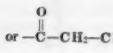
3,855,266
PREPARATION OF GAMMA-CYANOBUTYRALDEHYDE

Gerrit E. Beekhuis, Geleen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed June 12, 1973, Ser. No. 369,390
Claims priority, application Netherlands, June 12, 1972, 7207939
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.1 9 Claims

1. A process for recovering γ-cyanobutyraldehyde from the acid hydrolysis mixture obtained by the acid hydrolysis of an N-substituted γ-cyanobutyraldimine, wherein the N-substituent is an alkyl group of 1 to 10 carbon atoms, said hydrolysis forming the corresponding amine and said γ-cyanobutyraldehyde, said process comprising extracting γ-cyanobutyraldehyde from the acid hydrolysis mixture using an extracting amount of at least one extracting agent of the formula

Wherein:
X=H or Cl
Z=Cl or H
Y=Cl or, when X is H and Z is Cl, Y may also be $—CH_2Cl$, or, when X and Z are H, Y is nitro or



3,855,267
ALUMINUM PHOSPHATE-PROMOTED CATALYSTS FOR THE AMMONIALYTIC CLEAVAGE OF LACTAMS

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 859,555, Sept. 19, 1969, abandoned. This application Aug. 31, 1973, Ser. No. 393,494
Int. Cl. C07c *121/12*, *121/02*
U.S. Cl. 260—465.2 9 Claims

1. A method for the conversion of a lactam represented by the formula

to an ω-aminonitrile represented by the formula

wherein *n* is an integer of from 3 to 9, and R is selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, and combinations thereof, having up to about 8 carbon atoms per R group and a maximum of about 10 carbon atoms in all R groups of said lactam, which comprises

contacting said lactam with ammonia under suitable reaction conditions in the presence of a catalyst consisting essentially of aluminum phosphate on a substrate, wherein said substrate is selected from the group consisting of α-alumina and zeolites,

said reaction conditions comprising a temperature in the range of about 250° to about 75° C, a pressure in the range of about 0.1 to about 1,000 atmospheres, an ammonia to lactam mole ratio in the range of about 1 to about 1,000. and a time in the range of about 0.1 second to about 10 hours, and

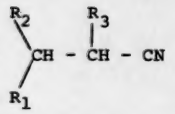
said aluminum phosphate being in the range of from about 0.05 to about 50 weight percent on said substrate.

3,855,268
OXYDEHYDROGENATION OF ORGANIC NITRILES

Roy B. Duke, Jr., Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed July 3, 1969, Ser. No. 839,045
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.3 16 Claims

1. A process for oxydehydrogenating nitriles of the general formula:



where R_1, R_2, and R_3 are selected from the group consisting of hydrogen, alkyl, alkenyl, aryl and mixtures thereof, and wherein the nitrile contains from 3 to 30 carbon atoms, said process being conducted in the vapor phase by forming a reaction mixture of the nitrile, iodine, and oxygen, the iodine and oxygen being present in an amount of about 0.001 to about 0.1 mole and at least 0.01 mole, respectively, per mole of nitrile, passing said reaction mixture through a reactor containing two zones, the first zone being substantially inert with respect to iodine, and the second zone comprising a catalytic mass of a chromite of a metal of Groups IIa, IVa, Va, Ib through VIIb, and VIII of the Periodic Table of Elements, said reaction mixture being passed through the two zones at temperatures of from about 300 to about 1300°F and gaseous hourly space velocities of about 5 to about 1500 hrs^{-1}.

3,855,269

APPARATUS AND METHOD FOR SEPARATING TETRAALKYLAMMONIUM SALT

William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 27, 1972, Ser. No. 275,555

Int. Cl. C07c *121/32*; **B01k** *1/00*; **C07c** *85/16*

U.S. Cl. 260—465.9 **6 Claims**

1. A method for separating tetraalkylammonium salts from a stream in the form of an emulsion, said emulsion stream being a product of an electrohydrodimerization process for converting acrylonitrile into adiponitrile, said emulsion stream consisting essentially of adiponitrile, acrylonitrile, other organics, inorganic salts, water and a small amount of a dissolved catalytic tetraalkylammonium salt, said method comprising:

passing said emulsion stream through a cooling zone and thus lowering the temperature thereof to a temperature in the range of about 70° to 50°F;

separating said first stream into a first organic phase stream and a first aqueous phase stream;

recovering said first aqueous phase;

passing said thus separated first organic phase stream through a refrigeration zone and thus lowering the temperature thereof to a temperature in the range of about 30° to 50°F;

separating said first organic phase stream into a second organic phase stream and a second aqueous phase stream containing a portion of said tetraalkylammonium salt; and recovering said second aqueous phase.

3,855,270

15-ALKYL PROSTAGLANDINS F

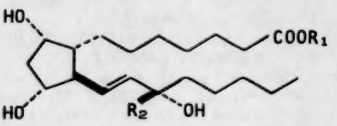
John E. Pike, Kalamazoo, and William P. Schneider, Kalamazoo Township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 37,308, May 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 648,992, June 26, 1967, abandoned. This application Sept. 13, 1972, Ser. No. 288,618

Int. Cl. C07c *61/32*, *69/74*

U.S. Cl. 260—468 D **6 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein R_1 is hydrogen, alkyl of one to 8 carbon atoms, inclusive, or a pharmacologically acceptable cation, and wherein R_2 is methyl or ethyl.

3,855,271

2-AMINO-2-ALLENYLMALONIC ESTERS

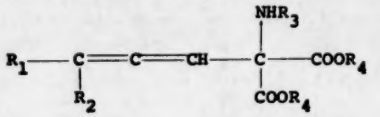
Robert D. Dillard, Zionsville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 20, 1973, Ser. No. 426,860

Int. Cl. C07c *101/20*

U.S. Cl. 260—468 J **7 Claims**

1. A compound of the following general formula:



wherein

R_1 and R_2 are independently-selected C_1–C_5 alkyl groups, or R_1 and R_2 taken together constitute a divalent polymethylene group having either 4 or 5 carbon atoms, which, together with the carbon atom to which it is attached, completes a five- or six-membered carbocyclic ring;

R_3 is either hydrogen or methyl, with the proviso that when R_1 and R_2 both are methyl, R_3 must be methyl; and

R_4 is monovalent C_1–C_6 alkyl group.

3,855,272

1-ALKOXYCARBONYL-2-ALKYLCARBAMOYLMETHYL-3-(2-ACYLAMIDOPHENYL)ISOTHIOUREA

Raymond Giraudon, Seine-et-Marne, France, assignor to Rhone-Poulenc, S.A., Paris, France

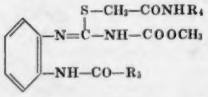
Filed May 29, 1973, Ser. No. 364,333

Claims priority, application France, May 30, 1972, 72.19321

Int. Cl. C07c *157/14*

U.S. Cl. 260—470 **6 Claims**

1. An isothiourea of the formula:



wherein R_4 is alkyl of 1 through 4 carbon atoms and R_5 is hydrogen, alkyl of 1 through 4 carbon atoms, or phenyl.

3,855,273

POLYAMIC ACIDS AND ESTERS

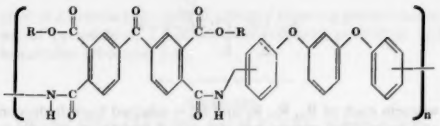
Norman Bilow, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 211,431, Dec. 23, 1971, abandoned. This application Sept. 5, 1972, Ser. No. 275,676

Int. Cl. C07c *103/30*

U.S. Cl. 260—471 R **8 Claims**

1. A polyimide precursor consisting essentially of the following recurring unit:



wherein *n* is from 1 to about 10, and R is H or alkyl having from 1 to about 5 carbon atoms.

3,855,274

PROCESS FOR PREPARING DIALKYL (ETHYLENEDIOXY) BIS-BENZOATE

Toshio Kato, Omiya, and Chisei Shibuya, Tokyo, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 14, 1971, Ser. No. 180,452
Int. Cl. C07c *69/78*
U.S. Cl. 260—473 R **8 Claims**

1. A process for preparing a dialkyl (ethylenedioxy)bis-benzoate comprising reacting an alkali salt of an alkyl hydroxybenzoate having one to eight carbon atoms in the alkyl group with ethylene dichloride in the presence of a saturated alcohol as a solvent, the improvement which comprises:

a. the alkali salt of the C_1 to C_8 alkyl hydroxybenzoate being dissolved in a concentration of 18 to 80 percent in a saturated alcohol which is an alkanol having one to six atoms or cyclohexanol or a mixture thereof, and

b. effecting the reaction at a temperature between 100° and 280° C. in the presence of 5 to 500 mole % of C_1 to C_8 alkyl hydroxybenzoate based on the amount of the alkali salt of said C_1 to C_8 alkyl hydroxybenzoate.

3,855,275

TREATMENT OF TEREPHTHALIC ACID REACTION

Charles N. Winnick, Teaneck, and Judd Posner, Hackensack, both of N.J., assignors to Halcon International, Inc., New York, N.Y.

Filed Apr. 30, 1971, Ser. No. 139,083
Int. Cl. C07c *69/82*
U.S. Cl. 260—475 PR **12 Claims**

1. A process of producing polyester precursors convertible into polyesters suitable for fiber and film formation which comprises (1) establishing a body of lower carboxylate esters of (beta-hydroxyethyl) terephthalate in admixture with components more volatile than said lower carboxylate esters and with components less volatile than said lower carboxylate esters, and containing deleterious amounts of color-producing impurities comprising 4-carboxy benzaldehyde and other compounds normally associated with terephthalic acid produced by catalytic oxidation and their lower carboxylate ester derivatives. (2) distilling said mixture to separate more volatile components therefrom and to leave a non-volatilized mixture comprising said lower carboxylate esters of (beta-hydroxyethyl) terephthalate, (3) distilling the non-volatilized mixture obtained from said first distillation to volatilize said lower carboxylate esters of (beta-hydroxyethyl) terephthalate away from less volatile materials, and thereby to produce a mixture comprising said lower carboxylate esters of (beta-hydroxyethyl) terephthalate, (4) reacting the mixture comprising said lower carboxylate esters of (beta-hydroxyethyl) terephthalate present in one of the preceding steps with at least one of an oxidizing agent effective to oxidize carbonyl groups and selected from the group consisting of molecular oxygen, peroxides, peracids, chromic acid, potassium permanganate, and nitric acid and a reducing agent effective to reduce carbonyl groups and selected from the group consisting of molecular hydrogen and alkali metal hydrides and borohydrides, and (5) hydrolyzing said carboxylate esters of (beta-hydroxyethyl) terephthalate after steps (3) and (4).

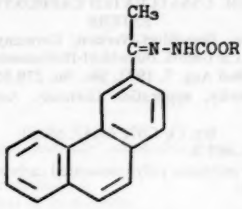
3,855,276

PHENANTHRYL ETHYLIDENE CARBAZIC ACID ESTERS

John Paul Dusza, Nanuet; Harry Lee Lindsay, Pearl River, and Seymour Bernstein, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 17, 1973, Ser. No. 425,421
Int. Cl. C07c *125/06*
U.S. Cl. 260—471 C **3 Claims**

1. A compound of the formula:



wherein R is lower alkyl C_1 to C_6.

3,855,277

FLAME RETARDANT COMPOUNDS AND THERMOPLASTIC COMPOSITIONS CONTAINING THE SAME

Daniel W. Fox, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Nov. 1, 1971, Ser. No. 194,518
Int. Cl. C08g *39/02*
U.S. Cl. 260—45.7 R **12 Claims**

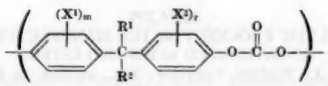
1. A flame retardant thermoplastic composition comprising

a. a normally flammable thermoplastic resin selected from the group consisting of

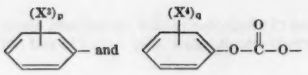
a polymerization product of a vinyl monomer;
a polymerization product of an olefin monomer;
a polymerization product of an acrylic or methacrylic monomer;
a polymerization product of an allyl monomer;
a polyamide;
a cellulose ester;
an aromatic polycarbonate;
a polyphenylene ether or a mixture thereof with a polystyrene resins; and
a mixture of at least two of the foregoing; and

b. a flame retardant amount of either

i. a low molecular weight polymer of a carbonate of a halogenated dihydric phenol, said polymer containing from 2 to 10 repeating units of the formula



wherein R^1 and R^2 are hydrogen, (lower) alkyl, or phenyl, X^1 and X^2 are bromo or chloro and *m* and *r* are from 1 to 4, said lower molecular weight polymer (i) being terminated with halogenated aromatic substituents of the formulae:



wherein X^3 and X^4 are bromo or chloro and p and q are each from 1 to 5, said polymer having low volatility when heated above about 200°C., and a softening point of less than about 300°C. or

ii. a combination of said polymer (i) and an inorganic or organic antimony-containing compound.

3,855,278

POLYBASIC UNSATURATED CARBOXYLIC ACID ESTERS

Helmut Singer, Dusseldorf-Wersten, Germany, assignor to Henkel and Cie GmbH, Dusseldorf-Holthausen, Germany

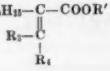
Filed Aug. 7, 1972, Ser. No. 278,564

Claims priority, application Germany, Aug. 25, 1971, 2142444

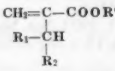
Int. Cl. C07c *69/52, 69/60*

U.S. Cl. 260—485 R **7 Claims**

1. A higher polybasic polyunsaturated carboxylic acid ester of the formula



in which R_2 is $-(CH_2)_n-COOR''$, R_1 is selected from the group consisting of hydrogen and R_2, n is 0 or 1, and R′ and R″ are each alkyl of 1 to 12 carbon atoms, produced by reacting butadiene with a carboxylic acid ester of the formula



in which R_1, R_2, R′, R″ and n have the same meanings as defined above, in a ratio of at least 2 mols of butadiene per mol of carboxylic acid ester in the presence of an organometal catalyst complex comprising zero-valent nickel and an electron donor selected from the group consisting of phosphorous acid trimorpholide, phosphorous acid-tri-N-methylanilide, tri-N,N-dialkylamides of phosphorous acid, hexylamine, dibutylamine, triethylamine, morpholine, N-methylmorpholine, piperidine, pyridine, picoline, collidine, quinoline, pyrrole, diphenylamine, triphenylamine, benzylamine, dimethylaniline, toluidine, acetonitrile, benzonitrile, triphenylphosphine, tritolyphosphine, triphenyl arsine, trinaphthyl arsine, tri-o-tolylarsine, triphenyl stibine, trinaphthyl stibine, and tri-o-tolylstibine, in the ratio of about 1 mol of electron donor per gram-atom of nickel; and recovering the said carboxylic acid ester.

3,855,279

CATALYTIC PROCESS FOR THE MANUFACTURE OF UNSATURATED ACIDS AND ESTERS

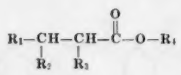
Windell C. Watkins, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 26, 1973, Ser. No. 409,823

Int. Cl. C07c *69/54, 57/04*

U.S. Cl. 260—486 D **11 Claims**

1. A process for making unsaturated acids and esters by dehydrogenation of a compound defined by the formula



wherein each of R_1, R_2, R_3 and R_4 is selected from hydrogen and lower alkyl groups containing 1–4 carbon atoms, which process comprises contacting a feed-gas mixture comprising said compound and oxygen at a temperature in the range of from about 250°C. to about 600°C. with a solid catalyst consisting of the calcined residue of a mixture of iron phosphate and lead phosphate wherein the atomic ratio of the metals is defined by 1 Fe/x Pb where x has a value of from about 0.1 to about 10.

3,855,280

PROCESS FOR PRODUCING AN ALKENYL ALKANOATE FROM AN OLEFIN AND A CARBOXYLIC ACID

Glen Maurice Severs, Jr., Pasadena, Tex., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 8, 1972, Ser. No. 313,299

Int. Cl. C07c *67/04, 69/14*

U.S. Cl. 260—497 A **8 Claims**

1. In a process for preparing vinyl acetate by passing a gaseous reactant mixture comprising molecular oxygen, ethylene, and acetic acid through a reaction zone maintained at a pressure between about 5 and about 15 atmospheres absolute and containing a catalyst comprising a Group VIII noble metal and reacting said ethylene, oxygen, and acetic acid in the presence of said solid catalyst to form vinyl acetate, the composition of said gaseous reaction mixture being controlled on the fuel-rich side of the range of potentially explosive mixtures of oxygen with the remaining components of said reaction mixture, the degree of conversion of the reactants within said reaction zone being limited by the necessity of maintaining the concentration of oxygen therein below the lower explosive limit, the improvement which comprises:

raising the lower explosive limit of oxygen in said reactant gas mixture, and so facilitating safe operation at an increased oxygen concentration, by incorporating from about 0.1 to about 0.8 moles per mole of ethylene of a diluent gas consisting essentially of a lower alkane which is free of secondary and tertiary hydrogen atoms into said reactant gas mixture prior to passing it through said reaction zone.

3,855,281

STABLE COMPOSITIONS FOR INHIBITING POLYMERIZATION OF UNSATURATED CARBOXYLIC ACID ESTERS

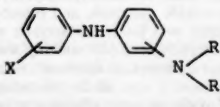
Alfred Bax Sullivan, Wadsworth, and Gene Ray Wilder, Medina, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 21, 1973, Ser. No. 399,437

Int. Cl. C07c *69/54, 69/52*

U.S. Cl. 260—486 R **12 Claims**

1. A monomer composition consisting essentially of unsaturated carboxylic acid ester and, in amount effective to inhibit polymerization of the ester, an inhibitor of the formula



in which X is hydrogen, chloro, trichloromethyl, trifluoromethyl, nitro, lower alkyl, lower alkoxy, or phenoxy and R and R_1 are lower alkyl or when X is hydrogen, R may be hydrogen when R_1 is tertiary alkyl or R and R_1 together with the nitrogen

atom is a heterocyclic radical selected from the group consisting of pyrrolidinyl, 2,5-dimethylpyrrolidinyl, piperidino and hexahydro-1H-azepin-1-yl.

3,855,282
STABILIZED CHOLINE SALICYLATE COMPOUNDS

William Kelly, deceased, late of Liverpool (by Monica Kelly); John Kelly, Great Sankey near Warrington, England, and Alfred Halpern, Lake Success, N.Y., assignors to Mundipharma AG, Rheinfelden, Switzerland

Filed Mar. 24, 1972, Ser. No. 237,927

Claims priority, application Great Britain, July 26, 1971, 34941/71

Int. Cl. C07c *91/00*

U.S. Cl. 260—501.15 **3 Claims**

1. The method for the preparation of choline salicylate salt-sulfur dioxide complex comprising the steps of:

a. cooling an aqueous solution of choline salicylate salt to about 0°C.,

b. passing gaseous sulfur dioxide through said solution at a rate sufficient to maintain the temperature between 0°C. and 5°C. and until the gain in weight of said solution is a molar equivalent of sulfur dioxide, equivalent to the molar quantity of choline salicylate used in step (a) above,

c. stirring, while warming to room temperature, and

d. recovering the formed choline salicylate salt-sulfur dioxide complex therefrom.

3,855,283
LEVO 1-AMINO-3-CHLORO-2-PROPANOL AND ACID ADDITION SALTS THEREOF

Elliott Cohen, Pearl River, N.Y., and Paul Rolf, River Vale, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 845,491, July 29, 1969, abandoned. This application June 19, 1970, Ser. No. 47,873

Int. Cl. C07c *91/02, 91/04*

U.S. Cl. 260—501.17 **4 Claims**

1. A compound selected from the group consisting of levo 1-amino-3-chloro-2-propanol and the non-toxic pharmaceutically acceptable acid-addition salts thereof.

3,855,284
PROCESS FOR THE MANUFACTURE OF PHOSPHONIC ACIDS AND PHOSPHONATES HAVING AT LEAST TWO PHOSPHORUS ATOMS

Hans Gunther Germscheid, Dusseldorf, Germany, assignor to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Continuation-in-part of Ser. No. 860,124, Sept. 22, 1969, abandoned, which is a continuation of Ser. No. 793,219, Jan. 10, 1969, abandoned, which is a continuation of Ser. No. 397,027, Sept. 16, 1964, abandoned. This application July 28, 1971, Ser. No. 167,044

Claims priority, application Germany, Nov. 2, 1963, 50724

Int. Cl. C07f *g/38*

U.S. Cl. 260—502.4 A **2 Claims**

1. A process for the manufacture of uniform, readily crystallizable phosphonic acids having at least two carbon and at least two phosphorus atoms in their molecules which consists of the steps of acylating PCl_3 with an excess up to 2 mols per mol of PCl_3 of acylating agents selected from the group consisting of alkanoic acids having two to 18 carbon atoms and benzoic acid in the presence of about 1½ mols of water per mol of PCl_3 at elevated temperatures up to the reaction boiling point, cooling the reaction mixture to a temperature from room temperature to below the boiling point of the alcohol added and adding thereto an alcohol selected from the group consisting of methanol and ethanol, said alcohol being added in amounts of from 1.1 to 20 times the stoichiometrical quantity, calculated on said excess of acylating agent, thoroughly mixing the reaction mixture while maintaining said temperature whereby volatile components having a lower boiling point than said acylating agent are formed, distilling said volatile components from said reaction mixture and recovering said phosphonic acids free from impurities.

3,855,285
ACYLMETHYLTHIO-TRIFLUOROMETHYL-BENZOIC ACIDS

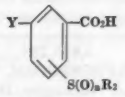
Gerald Fagan Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed June 21, 1971, Ser. No. 155,209

Int. Cl. C07c *149/40*

U.S. Cl. 260—516 **2 Claims**

1. A compound selected from the group consisting of those of the formula:



and the pharmaceutically acceptable basic salts thereof, wherein:

Y is trifluoromethyl;

R_2 acylmethyl of the formula

wherein R is selected from the group consisting of alkyl containing from 1 to 4 carbon atoms and phenyl and substituted phenyl wherein said substituent is selected from the group consisting of fluorine, chlorine, methyl, trifluoromethyl and methoxy; and

n is an integer from 0 to 2.

3,855,286
N-CARBOXYMETHYL-N-(2-HYDROXYBENZYL) ASPARTIC ACID AND DERIVATIVES THEREOF

Peter Baccini, Kriens, and Werner Fory, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

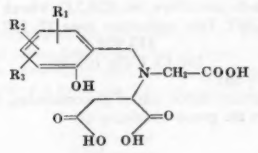
Filed Sept. 27, 1972, Ser. No. 292,708

Claims priority, application Switzerland, Oct. 1, 1971, 14347/71

Int. Cl. C07c *101/72*

U.S. Cl. 260—519 **6 Claims**

1. Asparagic acid derivatives of formula I and their alkali metal and ammonium salts



(I)

wherein

R_1 represents hydrogen, hydroxy, halogen, sulpho, carboxyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 halogenoalkyl, di-(C_1–C_6 alkyl)amino, C_2–C_4 alkanoyl or phenyl,

R_2 represents hydrogen, hydroxy, halogen, C_1–C_6 alkyl or C_1–C_6 alkoxy, and

R_3 represents hydrogen or C_1–C_6 alkyl.

3,855,287

PROCESS FOR THE PRODUCTION OF 4,4-DIBROMOBENZIL

Ward H. Oliver, Mobile, Ala., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 30, 1973, Ser. No. 346,400
Int. Cl. C07c *63/12, 49/80, 45/00*
U.S. Cl. 260—523 R **4 Claims**

1. A process for the production of 4,4′-dibromobenzil, which comprises

a. reacting benzene with cyanuric chloride in the presence of aluminum chloride at reflux temperatures,
b. reducing the resulting triphenyl-s-triazine in the presence of zinc at reflux temperatures,
c. brominating the resulting 2,4,5-triphenylimidazol with bromine,
d. oxidizing the bromination product with nitric acid and
e. recovering 4,4′-dibromobenzil from a mixture of 4,4′-dibromobenzil and p-brombenzoic acid.

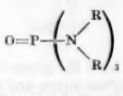
3,855,288

METHYLOLPHOSPHORIC TRIAMIDES

Patrick Michael Burke, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 12, 1972, Ser. No. 261,813
Int. Cl. C07f *9/22*
U.S. Cl. 260—551 P **6 Claims**

1. Methylolphosphoric triamide having the formula



wherein at least one of the six R groups is CH_2OH and the remainder if any are H, said triamide being characterized by the presence in its P–31 nuclear magnetic resonance spectrum of a band in the range 15–20 ppm. downfield from 85 percent aqueous phosphoric acid as external standard.

3,855,289

1-NAPHTHOIC ACID, 2,2-DIMETHYLHYDRAZIDE

Gerhard H. Alt, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed May 30, 1973, Ser. No. 365,336
Int. Cl. C07c *109/10*
U.S. Cl. 260—558 H **1 Claim**

1. 1-Napthoic acid, 2,2-dimethylhydrazide.

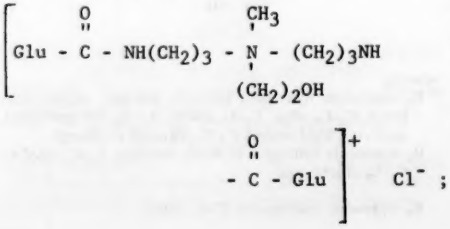
3,855,290

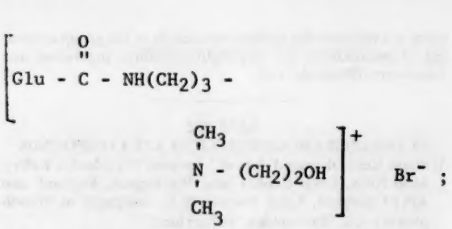
QUATERNARY HALIDES OF GLUCONAMIDES

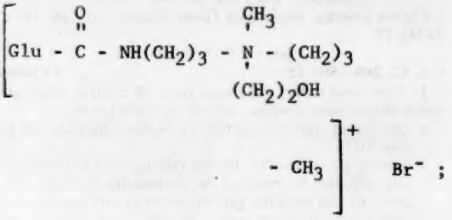
Henry Zak, Great Notch, and Donald E. Conner, Clifton, both of N.J., assignors to Van Dyk & Company, Incorporated, Belleville, N.J.

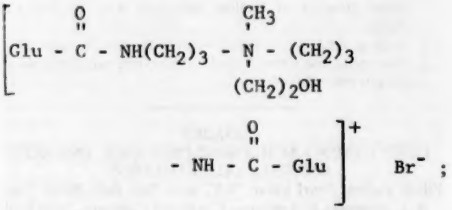
Continuation-in-part of Ser. No. 120,733, March 3, 1971, Pat. No. 3,766,267. This application June 27, 1973, Ser. No. 373,970
Int. Cl. C07c *103/30*
U.S. Cl. 260—561 B **4 Claims**

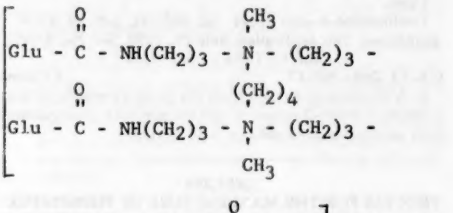
1. A quaternary halide salt of gluconamides, the salt being selected from the group consisting of:

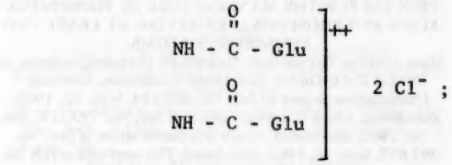


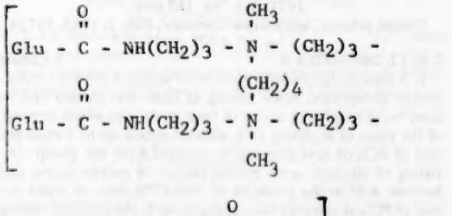


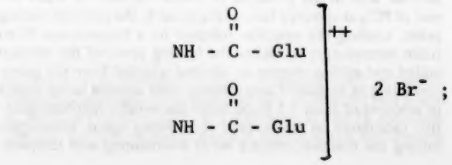












and the butyl bromide quaternary ammonium salt of Gamma Dimethylaminopropyl Gluconamide.

3,855,291

2-HALO-4-(AMINOACETAMIDO)-BENZYL ALCOHOLS

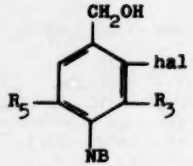
Sydney Archer, Bethlehem, and David Rosi, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 221,047, Jan. 26, 1972, , which is a continuation-in-part of Ser. No. 42,876, June 2, 1970, Pat. No. 3,714,167, which is a continuation-in-part of Ser. No. 664,628, Aug. 31, 1967, Pat. No. 3,558,629, which is a continuation-in-part of Ser. No. 444,848, April 1, 1965, Pat. No. 3,379,629. This application June 8, 1973, Ser. No. 368,183

Int. Cl. C07c *103/38*

U.S. Cl. 260—562 N 4 Claims

1. A compound of the formula:



where hal is halo; R_3 and R_5 are each hydrogen or lower-alkyl; NB is N(R)—Y—NR_1R_2; R is hydrogen or lower-alkyl; Y is $C(=O)CH_2$; R_1 and R_2 are each hydrogen, lower-alkyl, lower-alkenyl having from three to six carbon atoms or lower-hydroxyalkyl having from two to six carbon atoms and having its connecting linkage and the hyroxyl group on different carbon atoms, or R_1 and R_2 taken with N comprehend saturated N-heteromonocyclic radicals having from 5 to 6 ring atoms and selected from piperidino, pyrrolidino, morpholino, piperazino, hexamethyleneimino or such radicals having attached to available ring-atoms from one to three lower-alkyl groups; lower-alkyl in each instance having from one to six carbon atoms and being primary or secondary.

3,855,292

NEW AMINOPHENYLAMIDINES, THEIR PRODUCTION AND THEIR MEDICINAL USE

Hartmund Wollweber, Wuppertal-Elberfeld, Germany, and Winfried Flucke, Beenleigh, Australia, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

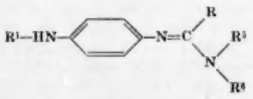
Filed June 9, 1971, Ser. No. 151,575

Claims priority, application Germany, June 13, 1970, 2029299

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 RF 6 Claims

1. A compound of the formula:



wherein:

R^1 is hydrogen, alkyl of 1 to 5 carbon atoms;

R is alkyl of 1 to 5 carbon atoms;

R^5 is alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms, or cycloalkyl of 3 to 6 carbon atoms; and

R^6 is hydrogen, alkyl of 1 to 5 carbon atoms or alkenyl of 2 to 5 carbon atoms, or a salt thereof of a pharmaceutically acceptable acid.

3,855,293

NOVEL AMINE COMPOUNDS

Heinz Gunter Viehe, and Zdenek Janousek, Leuven, both of Belgium, assignors to Roussel UCLAF, Paris, France

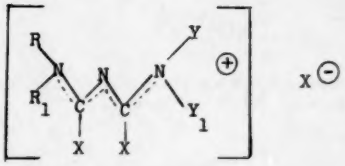
Filed Aug. 3, 1973, Ser. No. 385,452

Claims priority, application France, Aug. 9, 1972, 72.28726

Int. Cl. C07c *123/00*

U.S. Cl. 260—564 R 7 Claims

1. A compound of the formula



wherein R, R_1, Y and Y_1 are individually alkyl of 1 to 5 carbon atoms and X is a halogen and the dotted lines represent 2 conjugated double bonds.

3,855,294

SUBSTITUTED 1-AMINOADAMANTANES

Ctirad Podesva, and Carola Solomon, both of Montreal, Quebec, Canada, assignors to Delmar Chemicals Limited, Montreal, Quebec, Canada

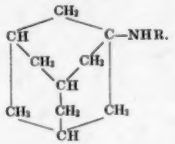
Filed Oct. 2, 1967, Ser. No. 671,935

Claims priority, application Great Britain, Oct. 18, 1966, 46575/66

Int. Cl. C07c *87/28*

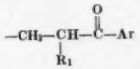
U.S. Cl. 260—570 R 10 Claims

1. A 1-aminoadamantane derivative of formula I



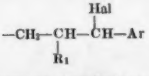
I

or a pharmaceutically acceptable acid addition salt thereof wherein R represents a radical selected from the group consisting of



(a)

and



(b)

wherein Ar represents an unsubstituted or a mono nitro-substituted or mono halo-substituted or mono lower alkoxy-substituted or mono lower alkyl-substituted phenyl, R_1 represents hydrogen or a lower alkyl group, and Hal represents a halogen.

3,855,295

6-[SPIRO-4'-(OPTIONALLY SUBSTITUTED AMINO) CYCLOHEXYL]-1,1a,6,10b-TETRAHYDRODIBENZO [a,e]CYCLOPROPA[c]CYCLOHEPTENES

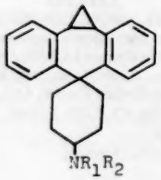
John W. Cusic, Skokie, and Charles R. Ellefson, Chicago, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed June 15, 1973, Ser. No. 370,462

Int. Cl. C07c *87/40*

U.S. Cl. 260—570.5 CA 6 Claims

1. A compound of the forumla



wherein R_1 and R_2 are selected from the group consisting of hydrogen and lower alkyl radicals.

3,855,296

CYCLO-SUBSTITUTED-1-p(ω-AMINOALKOXY)PHENYL CYCLOHEXANES

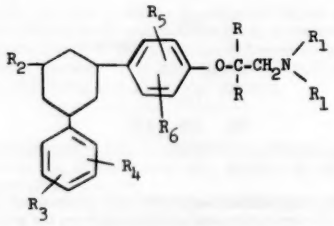
Rudolf G. Griot, Basel-Stadt, Switzerland, assignor to Sandoz-Wander, Inc., Hanover, N.J.

Continuation-in-part of Ser. No. 725,198, April 29, 1968,. This application Apr. 3, 1969, Ser. No. 813,324

Int. Cl. C07c *93/06*

U.S. Cl. 260—570.7 **8 Claims**

1. A compound from the group of: (A) compounds of the formula:



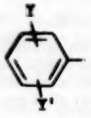
wherein each of

R is, independently, hydrogen or lower alkyl;

each of

R_1 is, independently, lower alkyl,

R_2 is hydrogen, phenyl or substituted phenyl of the formula:



each of

Y, Y′, R_3 and R_4 is, independently, hydrogen, halo of atomic weight not exceeding 80, lower alkyl or lower alkoxy, provided R_3 and R_4 are hydrogen when R_2 is hydrogen and providing that R_3, R_4, Y and Y′ together represent no more than a total of two alkyl and alkoxy substituents, and

each of

R_5 and R_6 is, independently, hydrogen or lower alkyl;

B. N-oxides of said compounds; and

C. the pharmaceutically acceptable acid addition salts of (A) and (B), above.

3,855,297

1,1′-BRIDGED-BIS[N-(ALKYL)-2-AMINOETHANOLS]

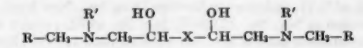
Guy D. Diana, Stephentown, and Royal A. Cutler, Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 10, 1971, Ser. No. 123,096

Int. Cl. C07c *95/00, 97/00*

U.S. Cl. 260—584 R **18 Claims**

1. 1,1′-(X)-bis[2-[(R-CH_2)(R′)amino]ethanol] of the formula



wherein:

R is hydrogen, alkyl of one to 15 carbon atoms or cycloalkyl of four to seven ring carbon atoms;

R′ is hydrogen or atertiary alkyl of one to four carbon atoms;

X is a direct linkage, methylene or alkylene of two to 12 carbon atoms with bonds to the adjacent carbon atoms at different carbon atoms; or

acid-addition salts thereof.

3,855,298

METHOD OF PURIFICATION OF TRILAURYLAMINE

Andre Bathellier, Sceaux, and Michel Germain, Boulogne, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed June 3, 1968, Ser. No. 734,024

Claims priority, application France, June 6, 1967, 67.109351

Int. Cl. C07c *85/16*

U.S. Cl. 260—583 N **7 Claims**

1. A method for the purification of a trilaurylamine-containing dodecane diluent and the removal of dilaurylamine therefrom which comprises precipitating the dilaurylamine by adding to said diluent (1) an acid selected from the group consisting of HF, HCl, HNO_3, H_3PO_4, H_2SO_4, $HClO_4$, HSO_3NH_2, HCOOH, CH_3COOH, HOOC—COOH, $ClCH_2COOH$ and $C_{11}H_{23}COOH$ or (2) an acid salt of trilaurylamine selected from the group consisting of inorganic hydracid salts, inorganic oxacid salts, sulfonic acid salts and carboxylic acid salts in a quantity which is stoichiometric with respect to the amount of dilaurylamine contained in said diluent, thereby forming a salt of the dilaurylamine which is insoluble in said diluent, and separating the resultant precipitate from the diluent.

3,855,299

WATER SOLUBLE REACTION PRODUCT OF EPIHALOHYDRIN AND ALKYLAMINES

Edward Witt, Framingham, Mass., assignor to W. R. Grace & Co., New York, N.Y.

Filed June 11, 1973, Ser. No. 368,968

Int. Cl. C07c *91/02*

U.S. Cl. 260—584 R **11 Claims**

1. A water soluble product prepared by: (a) admixing in an aqueous medium; (i) a member selected from a first group consisting dimethylamine and diethylamine; and (ii) a member selected from a second group consisting of dimethylaminopropylamine, dimethylaminobutylamine, and ammonia; (b) adding thereto a member selected from a third group consisting of epichlorohydrin, epibromohydrin,

$CH_2ClCHClCH_2OH$,

$CH_2ClCH_2(OH)CH_2Cl$,

$CH_2CHClCHClCH_2OH$, and

$CH_2CHClCH(OH)CH_2Cl$

while maintaining the temperature of the resulting reacting mixture at 25°–125°C., and (c) maintaining the temperature of the mixture at 25°–125°C until its viscosity reaches 20–20,000 centipoises, the equivalent ratio of third group member to second group member being 1:0.009–0.5, the

equivalent ratio of third group member to first group member being 1:0.22–1.3, the equivalent ratio of first group member to second group member being greater than 1, and the mole ratio of first group member to water being 1:1–100.

3,855,300

PROCESS FOR THE PRODUCTION OF 2-AMINO-1-BUTANOL

Makoto Takahashi; Tsunetoshi Shioya; Takashi Kobayashi; Tatsuji Fujii, and Masakuni Nishimura, all of Kamakura, Japan, assignors to Sankyo Chemical Industries, Ltd., Tokyo, Japan

Filed Sept. 5, 1973, Ser. No. 394,540
Int. Cl. C07c *89/00*
U.S. Cl. 260—584 R **3 Claims**

1. A process for the production of 2-amino-1-butanol, which comprises reacting 1-butene with chlorine and a nitrile compound and then hydrolyzing the resulting reaction product.

3,855,301

NOVEL DIHYDROCHALCONE AND PROCESS

George P. Rizzi, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 28, 1971, Ser. No. 157,682
Int. Cl. C07c *49/82*
U.S. Cl. 260—590 **4 Claims**

1. 3-(m-hydroxyphenyl)phloropropiophenone.

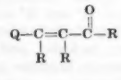
3,855,302

INTRODUCTION OF ORGANIC GROUPS INTO ETHYLENICALLY UNSATURATED ALDEHYDES OR KETONES USING A GROUP VIII METAL SALT

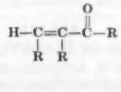
Richard F. Heck, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 883,287, Dec. 8, 1969, abandoned, which is a division of Ser. No. 479,665, Aug. 13, 1965, Pat. No. 3,527,794. This application May 4, 1972, Ser. No. 250,461
Int. Cl. C07c *49/76, 49/82, 47/56*
U.S. Cl. 260—590 **7 Claims**

1. The process of producing a carbonyl compound of the formula



which comprises contacting and reacting an ethylenically unsaturated aldehyde or ketone of the formula



with an organometallic compound of tne formula QPdX at a temperature in the range of 0℃. to about 200℃., in which formulae R is a member of the group consisting of hydrogen, methyl and monovalent aromatic hydrocarbon groups, the total number of carbons in the ethylenically unsaturated aldehyde or ketone being no more than 10, X is an anion of the group consisting of halides, cyano, nitrate, sulfates, perchlorate, fluoroborate, benzoate, acetate, trifluoroacetate and acetylacetonate, and Q is the organo group of said organometallic compound QPdX, Q in said organometallic compound being bonded to the palladium by a carbon to metal linkage and being selected from the group consisting of aryl radicals and methoxy-, chloro-, bromo-, fluoro-, nitro-, hydroxy, formyl-, benzoyl-, phenyl- and methyl-substituted aryl radicals, wherein the aryl radical is a member of the group consisting of phenyl and naphthyl.

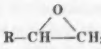
3,855,303

ISOMERIZATION OF ALPH-EPOXIDES

Clyde E. Bishop, Indianapolis, Ind., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 46,515, June 15, 1970, abandoned. This application Apr. 24, 1972, Ser. No. 246,857
Int. Cl. C0c7 *49/04*
U.S. Cl. 260—593 R **12 Claims**

1. A process of isomerizing an α-epoxide having the formula



wherein R is an alkyl, aryl, cycloalky, aralkyl, alkaryl, cycloalkylalkyl, or alkylcycloalkyl radical having 1 to 30 carbon atoms per radical, to yield predominantly n-aldehydes, said process comprising contacting the α-epoxide at a temperature of about 50℃ to about 250℃ with a catalyst system consisting essentially of a compound having the formula R'_3PO, where R′ is an alkyl or aryl radical having 2 to 12 carbon atoms per radical, and an alkali metal perchlorate compound, said catalyst system containing said first-mentioned compound and said perchlorate compound in a weight ratio to each other of 1:1 to 10:1

3,855,304

PROCESS FOR PRODUCING ACETONE

Kozo Sakakibara, and Kiyoshi Yasuda, both of Saitama, Japan, assignors to Daicel Ltd.,, Osaka, Japan

Division of Ser. No. 199,716, Nov. 17, 1971, Pat. No. 3,804,902
Filed Aug. 3, 1973, Ser. No. 385,594
Claims priority, application Japan, Nov. 21, 1970, 45-103046; Dec. 30, 1970, 45-122246
Int. Cl. C07c *49/08*
U.S. Cl. 260—593 R **8 Claims**

1. A process for producing acetone, which comprises contacting gaseous isobutyl aldehyde and a mixture of oxygen and inert diluent gas, with a catalyst consisting of manganese oxide and alkali metal hydroxide supported on activated alumina as a carrier, at a reaction temperature of from 150 to 250℃, for a contact time of from 0.5 to 10 seconds.

3,855,305

METHOD FOR PREPARING AROMATIC ALDEHYDES

Walter A. Gay, Cheshire, and Maurice A. Raymond, Northford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 7, 1972, Ser. No. 224,272
Int. Cl. C07c *45/16*
U.S. Cl. 260—600 **10 Claims**

1. A method for the preparation of an aromatic aldehyde comprising:

a. reacting benzyl alcohol or substituted benzyl alcohol having a substituent selected from the group consisting of alkyl, aryl, alkoxy, hydroxyl, halogen, and nitro groups, with oxygen in the presence of a primary amine of the formula:

$$RNH_2$$

where R is an aliphatic or aromatic hydrocarbon of up to 12 carbon atoms or an anisyl group

at a temperature of from about 20° to about 500℃. and wherein a molar ratio of said amine to said benzyl alcohol or substituted benzyl alcohol of from about 0.1:1 to about 100:1 is used, and

b. hydrolyzing the resulting product with acid to form the respective aldehyde compound.

3,855,306

PROCESS FOR THE PREPARATION OF 2,4,5-TRIMETHOXYBENZALDEHYDE

Pius Anton Wehrli, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 27, 1972, Ser. No. 238,629
Int. Cl. C07c 45/00
U.S. Cl. 260—600 22 Claims

1. A process for the preparation of 3,4,5-trimethoxybenzaldehyde which comprises:

a. adding a solution of vanillin in an acidic solvent medium selected from the group consisting of concentrated aqueous mineral acids and glacial acetic acid to bromine at a temperature about 0° and about 5°C to afford 5-bromovanillin;

b. contacting the 5-bromovanillin prepared in (a) with an alkali metal hydroxide and from about 1 to about 10 mole % of copper powder, in water at a temperature of from about 50° to about 120° C to afford 5-hydroxyvanillin; and

c. contacting the 5-hydroxyvanillin prepared in (b) with a 15 to 25% excess of dimethyl sulfate, and a powdered alkali metal carbonate, in an organic medium selected from the group consisting of acetone, methyl ethyl ketone, tetrahydrofuran, dioxane, hexane, heptane, benzene and toluene.

3,855,307

CATALYSIS

Peter R. Rony, St. Louis, and James F. Roth, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 617,338, Feb. 20, 1967, abandoned. This application Feb. 6, 1968, Ser. No. 703,382
Int. Cl. C07c 45/08
U.S. Cl. 260—604 HF 2 Claims

1. Process for the hydroformylation of unsaturated hydrocarbons having from 2 to 6 carbon atoms which comprises contacting the said unsaturated hydrocarbons in gaseous form at a temperature of from 25°C to 300°C and a pressure in the range of from atmospheric to 3,000 psig in the presence of carbon monoxide and hydrogen with a multiphase catalyst comprising a porous, solid carrier having dispersed thereon a liquid catalytic component including a solvent having a vapor pressure at 100°C of from 10^{-12} to 10 millimeters, and an aryl phosphine complex of rhodium, and being characterized by a liquid loading of the said multiphase catalyst in the range of from 0.10 to 0.80 cm^3 of the said liquid catalytic component per cm^3 pore volume of the said porous solid carrier.

3,855,308

PROCESS FOR THE PREPARATION OF UNSATURATED CARBONYL COMPOUNDS

Michio Ueshima, Nishinomiya; Isao Yanagisawa, Ikeda; Masahiro Takata, Toyonaka, and Michikazu Ninomiya, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed June 6, 1972, Ser. No. 260,222
Claims priority, application Japan, June 9, 1971, 46-40128
Int. Cl. C07c 45/04
U.S. Cl. 260—604 R 10 Claims

1. A process for the preparation of unsaturated carbonyl compounds which comprises carrying out the catalytic vapor phase oxidation of an olefin selected from the group consisting of propylene and isobutylene, in the presence of molecular oxygen, and in the presence of a catalytic oxide in which the atomic ratio among the constituent catalytic elements, Co:Fe:Bi:W:Mo:Si:Tl:Z ranges 2.0–20.0 : 0.1–10.0 : 0.1–10.0 : 0.5–10.0 : 2.0–11.5 : 0.5–15.0 : 0.005–3.0 : 0 – 3.0, with the proviso that W plus Mo equals 12.0, and Z stands for a metal selected from the group consisting of the alkali metals and alkaline earth metals, at temperatures ranging from 250° to 450°C. and pressures ranging from normal pressure to 10 atmospheres.

3,855,309

PROCESS FOR THE MANUFACTURE OF PHOSPHORUS-CONTAINING CONDENSATION PRODUCTS, THE PRODUCTS AND THEIR USE AS FLAMEPROOFING AGENTS

Hermann Nachbur, Dornach, and Arthur Maeder, Therwill, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Aug. 31, 1972, Ser. No. 285,418
Claims priority, application Switzerland, Jan. 14, 1972, 522/72
Int. Cl. C07f 9/28
U.S. Cl. 260—606.5 P 10 Claims

1. A process for the manufacture of water-soluble condensation products, comprising the step of reacting a tetrakis-(hydroxymethyl)-phosphonium compound with triglycidylisocyanurate, at a temperature in the range of 40° to 120°C, and in a molar ratio of 1:0.02 to 1:0.5.

3,855,310

METHOD FOR PREPARING PHOSPHORUS COMPOUNDS

Vilas M. Chopdekar, Parlin, N.J., assignor to M & T Chemicals Inc., Greenwich, Conn.

Filed Sept. 4, 1973, Ser. No. 394,174
Int. Cl. C07j 9/52
U.S. Cl. 260—606.5 P 5 Claims

1. A method for preparing trihydrocarbon phosphorus dihalides, R_3PY_2 said method consisting of the following steps:
1. reacting substantially equimolar quantities of a phosphorus trihalide, PX_3, an elemental halogen, Y_2, and a trihydrocarbon phosphine oxide, $R_3{}^1PO$, in the presence of a halobenzene diluent having a melting point of less than about 55°C. and boiling point below about 250°C., the reaction being carried out at a temperature of between ambient and 100°C. and in the presence of between 0.01 and 10%, based on the weight of the phosphine oxide of a N,N- dialkyl amide catalyst of the general formula

wherein R^1 represents an alkyl, cycloalkyl, aryl, alkaryl or aralkyl hydrocarbon radical containing between 1 and 20 carbon atoms, inclusive; R^2 and R^3 are individually selected from the group consisting of alkyl radicals containing between 1 and 20 carbon atoms, inclusive, and X and Y are individually selected from chlorine, bromine and iodine,

2. removing the phosphorus oxyhalide formed as a by-product of the reaction, and

3. separating the resultant trihydrocarbon phosphorus dihalide from said halobenzene diluent.

3,855,311

PRODUCTION OF DIALKYLPHOSPHINES

Horst Staendeke, Bruehl, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt/Main, Germany

Filed Nov. 8, 1973, Ser. No. 413,850
Claims priority, application Germany, Nov. 11, 1972, 2255395
Int. Cl. C07f 9/50
U.S. Cl. 260—606.5 P 18 Claims

1. A process for the manufacture of dialkylphosphines of the general formula R_2PH, in which each R stands for an alkyl group having from 1 to 3 carbon atoms, comprising in a first step flowing a gaseous mixture of phosphorus and an alkyl halide having from 1 to 3 carbon atoms in the alkyl radical by means of a carrier gas, in the absence of oxygen and at a temperature between 300° and 450°C, over an active carbon catalyst; subjecting the resulting gaseous reaction mixture to fractional condensation so as to initially isolate trialkylphos-

phonium halide and unreacted phosphorus therefrom and thereafter to isolate a homogeneous mixture comprised of a dialkylhalogenophosphine/hydrogen halide-addition product and dialkylphosphonium halide, and in a second step solvolyzing the said mixture with an alcohol with the resultant formation of dialkylphosphine oxide (from the dialkylhalogenophosphinehydrogen halide addition product), the dialkylphosphonium halide remaining substantially unchanged; establishing in the solvolyzed material a pH-value of at least 2; and separating dialkylphosphine from the solution obtained.

3,855,312

PRODUCTION OF DI-4-CHLOROPHENYL SULPHONE

Patrick James Horner, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 112,892, Feb. 5, 1971, abandoned. This application Oct. 25, 1972, Ser. No. 300,871

Claims priority, application Great Britain, Feb. 6, 1970, 5793/70; Jan. 15, 1971, 2112/71; Oct. 16, 1972, 47547/72

Int. Cl. C07c *147/08*

U.S. Cl. 260—607 A **15 Claims**

1. A process for the preparation of di-4-chlorophenyl sulphone in which (1) a reaction mixture containing 4-chlorobenzenesulphonic acid, itself formed by the reaction of chlorobenzene with sulphur trioxide in sulphuric acid, and chlorobenzene is kept at a temperature lying between 220°C and 260°C at a superatomspheric pressure lying between 30 and 1100 kN/M², (2) the reaction mixture is (A) sparged with an inert gas or (B) kept boiling at a temperature lying between 220°C and 260°C at a superatmospheric pressure lying between 30 and 1100 kN/m² by (i) progressively reducing the pressure as the reaction proceeds or (ii) adding further quantities of chlorobenzene to the reaction mixture as the reaction proceeds so that water is removed as vapour continuously as it is formed, and (3) the water vapour and accompanying chlorobenzene vapour are condensed and separated and the chlorobenzene is returned to the reaction mixture.

3,855,313

INSECTICIDAL BIODEGRADABLE METHYLTHIO ANALOGS OF DDT

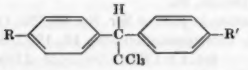
Robert L. Metcalf; Inder Kapoor, and Asha Hirwe, all of Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Division of Ser. No. 147,247, May 26, 1971, Pat. No. 3,787,505. This application Sept. 6, 1973, Ser. No. 394,567

Int. Cl. C07c *149/30*

U.S. Cl. 260—609 E **2 Claims**

1. Asymmetrical, biodegradable insecticides having the formula:



where R and R′ are different and *R* is selected from the group consisting of —CH_3, CH_3O, —C_2H_5O, —C_3H_7O, and R′ is —SCH_3.

3,855,314

METHOD OF SYNTHESIZING ISOPENTANE HYDROPEROXIDE

Claude Dubois, Martigues, and Jean Maurin, Seine Maritime, both of France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Mar. 25, 1971, Ser. No. 127,958

Claims priority, application France, Mar. 27, 1970, 70.11121

Int. Cl. C07c *73/06*

U.S. Cl. 260—610 B **3 Claims**

1. In the method of noncatalyzed synthesis of isopentane hydroperoxide from isopentane in a liquid reaction medium by action of molecular oxygen, the improvement consisting essentially of hydroperoxidizing isopentane at a temperature between 100° and 200°C by adding to the liquid reaction medium tertiary alcohol selected from the group consisting of tertiary butyl alcohol, 2-methyl 2-butanol, 2-methyl 2-butanol, 2-methyl 2-pentanol, and 3-methyl 3-pentanol in an amount between 0.75 per cent and 8 per cent of the total number of gram molecules constituting the liquid reaction medium.

3,855,315

NOVEL DIACYL PEROXIDES

Donald L. Deardorff, 43 Colony Rd., Riverside; Edwin T. Chesler, 118 Crown Ave., East Providence, both of R.I. 02915, and Joseph Fath, 20 Clarke Rd., Barrington, R.I. 02806

Division of Ser. No. 729,451, May 15, 1968, Pat. No. 3,728,402. This application Nov. 2, 1972, Ser. No. 303,039

Int. Cl. C07c *73/02*

U.S. Cl. 260—610 D **5 Claims**

1. A di 3-(alkoxy) propionyl peroxide selected from the group consisting of

di 3-(2-ethylhexoxy) propionyl peroxide,
di 3-(isohexoxy) propionyl peroxide,
di 3-(isobutoxy) propionyl peroxide, and
di 3-(n-butoxy) propionyl peroxide.

3,855,316

ARALKYL ALKYL ETHERS OF POLYMETHYLENE GLYCOLS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Aug. 7, 1972, Ser. No. 278,336

Int. Cl. C07c *43/20*

U.S. Cl. 260—611 A **6 Claims**

1. An aralkyl alkyl ether of a polymethylene glycol having the formula:

$$R(OCH_2)_nOR'$$

in which R is an unsubstituted aralkyl hydrocarbon radical, R′ is an alkyl radical of from 1 to about 4 carbon atoms, and n is an integer of from 2 to about 20.

3,855,317

2-4-HALOBENZYL PHENOLS AND PREPARATION THEREOF

Jacques Debat, Paris, France, assignor to Societe a Responsabilite Limitee dite: Institut de Recherches Chimiques et Biologiques Appliquees (I.R.C.E.B.A.), Paris, France

Continuation of Ser. No. 755,232, Aug. 26, 1968, abandoned. This application June 28, 1972, Ser. No. 267,073

Claims priority, application Great Britain, Aug. 31, 1967, 39816/67

Int. Cl. C07c *39/12, 39/24*

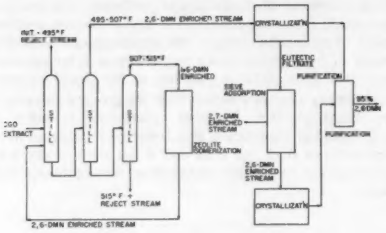
U.S. Cl. 260—619 R **4 Claims**

1. The compound 2-(2′, 4′-dichlorobenzyl)-4-ter. butylphenol.

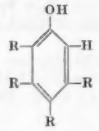
3,855,318
SELECTIVE METHYLATION OF PHENOLS

Hitoshi Nakajima, Saitamaken; Fujio Nomura, and Shinichi Iszwa, both of Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 13, 1971, Ser. No. 207,546
Claims priority, application Japan, Dec. 11, 1970, 45-109385; Dec. 17, 1970, 45-112490; Dec. 17, 1970, 45-112491
Int. Cl. C07c *37/16*
U.S. Cl. 260—621 R 18 Claims



1. A process of methylating a phenol in the ortho position which comprises reacting methanol with a phenol having the formula



wherein each R is a monovalent substituent selected from the group consisting of hydrogen, methyl, phenyl, and methyl substituted phenyl in the vapor phase in the presence of a vanadium oxide catalyst at a temperature of from about 250°C. to 450°C.

3,855,319
PRODUCTION OF HYDROXY COMPOUNDS BY HYDROGENOLYSIS OF BUFFERED CARBOXYLATE SALTS

Charles C. Hobbs, and John A. Bedford, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 64,665, Aug. 17, 1970, Pat. No. 3,752,861. This application Dec. 15, 1972, Ser. No. 315,385
Int. Cl. C07c *29/00*
U.S. Cl. 260—635 D 5 Claims

1. In a process for converting a feedstock comprising predominantly at least one member of the group consisting of carboxyalkanes, dicarboxyalkanes, hydroxycarboxyalkanes, and lactones of hydroxycarboxyalkanes having at least four carbon atoms in the molecule to a corresponding hydroxymethyl-substituted derivative by the hydrogenolysis of the carboxy moiety of said feedstock in the present of a rhenium black catalyst or a catalyst having a catalytically active metallic cobalt surface, the improvement which comprises:

preparing an alkali metal salt of said feedstock in aqueous solution;

buffering said solution of said salt to a pH between about 6.0 and about 7.0;

hydrogenolyzing said salt in said buffered solution in the presence of said catalyst at a temperature of 150°C to 300°C and at a pressure of about 5 to 500 atmospheres to form a liquid reaction product comprising said hydroxymethyl-substituted compound; and

recovering said hydroxymethyl-substituted compound from said reaction product.

3,855,320
PURIFICATION OF ZIEGLER ALCOHOLS

Bruce E. Leach, and Kaye L. Motz, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Aug. 2, 1973, Ser. No. 385,217
Int. Cl. C07c *29/24*, *33/02*
U.S. Cl. 260—643 F 5 Claims

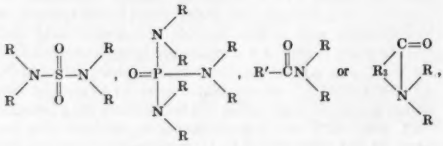
1. An improved method for treating primary alcohols obtained by hydrolyzing an air-oxidized mixture of aluminum alkyls prepared by growing aluminum triethyl in the presence of ethylene to provide an alcohol product essentially free of dihydroxy compounds wherein the improvement comprises contacting said primary alcohols in the liquid phase with a calcium oxide on alumina catalyst at a temperature between about 170° and 275° C.

3,855,321
CONVERSION OF OLEFINS TO ALLYLIC CHLORIDES

Hartwig C. Bach, and Helmuth E. Hinderer, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 12, 1970, Ser. No. 2,356
Int. Cl. C07c *21/00*
U.S. Cl. 260—654 R 8 Claims

1. A process for the preparation of allyl chloride by catalytic chlorination of propylene in a homogeneous liquid phase catalyst system comprising dissolving and reacting at a temperature between about 0° and 180°C. propylene, palladium chloride and cupric chloride in a solvent consisting of at least one N,N-dialkylamide of the formula



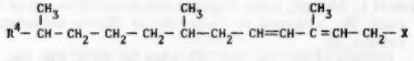
where R represents an alkyl radical, R′ represents a hydrogen, alkyl or alkaryl radical R^3 represents $-(CH_2)-_n$ in which n is an integer from 3 to 12.

3,855,322
ALIPHATIC DI-OLEFINIC HALIDES

Clive A. Henrick, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. Nos. 187,898, Oct. 8, 1971, Pat. No. 3,752,843, and Ser. No. 111,673, Feb. 1, 1971, abandoned. This application Dec. 10, 1971, Ser. No. 206,918
Int. Cl. C07c *21/04*
U.S. Cl. 260—654 R 3 Claims

1. A compound of the formula:



wherein,

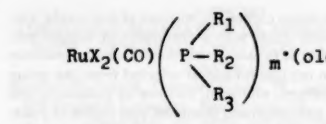
R^4 is methyl or ethyl and X is bromo or chloro.

3,855,323
OLEFIN ISOMERIZATION CATALYSTS AND PROCESS

James E. Lyons, Wallingford, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 80,750, Oct. 14, 1970, abandoned. This application May 10, 1972, Ser. No. 251,986
Int. Cl. C07c *5/00*, *5/22*, *15/00*
U.S. Cl. 260—666 A 11 Claims

1. A process for the isomerization of olefins which comprises contacting said olefins under an inert atmosphere with a catalyst consisting essentially of a metal carbonyl of the formula



wherein X is halogen; R_1, R_2 and R_3 are lower alkyl groups having from 1 to 6 carbon atoms, cycloalkyl or aryl, and each of R_1, R_2 and R_3 may be the same or different; *m* is 2 or 3; and *n* is 0 or 1.

3,855,324

HYDROGENATION OF ORGANIC COMPOUNDS

Joseph K. Mertzweiller, and Horace M. Tenney, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 880,933, Nov. 28, 1969, Pat. No. 3,711,423, which is a continuation-in-part of Ser. No. 674,098, Oct. 10, 1967, abandoned. This application May 16, 1972, Ser. No. 253,765

Int. Cl. C07c *5/00*

U.S. Cl. 260—666 P **16 Claims**

1. A process for the hydrogenation of a feed containing cyclododecatriene comprising the steps of:

forming a catalyst by

impregnating a support containing at least about 0.1 millimole of hydroxyl groups per gram of support, said support comprising alumina with an aqueous solution of a transition metal salt comprising nickel acetate;

heat treating the impregnated support at a temperature of at least about 500°F;

activating the heat-treated impregnated support by contacting same with an organometallic compound having the formula: QR_n, wherein Q is selected from Group I, II or III metals of the Periodic Chart of the Elements, R is selected from the group consisting of hydride and alkyl, aryl, alkaryl, aralkyl and cycloalkyl radicals containing from 1 to about 20 carbon atoms and wherein n ranges from 1 to 3 and satisfies the valence of Q;

treating the activated supported metal complex in the presence of hydrogen at a temperature of at least about 300°F.;

and thereafter contacting said catalyst with said feed in the presence of a hydrogen-containing gas, thereby producing a hydrogenation reaction.

3,855,325

ALKYLATION OF SATURATED HYDROCARBONS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 212,721, Dec. 27, 1971, abandoned. This application Aug. 15, 1973, Ser. No. 388,696

Int. Cl. C07c *3/54*

U.S. Cl. 260—666 P **10 Claims**

1. A process for the alkylation of a saturated hydrocarbon containing from about 3 to about 12 carbon atoms per molecule which consists essentially of reacting said hydrocarbon with an olefinic hydrocarbon containing from 2 to about 10 carbon atoms per molecule in contact with free hydrogen chloride and an oxygen-containing gas present in an amount of from about 0.001:1 up to about 1:1 moles of oxygen per mole of saturated hydrocarbon at reaction conditions, including a temperature of from about 160°C. to about 260°C. and recovering the resultant alkylated saturated hydrocarbon.

3,855,326

PRODUCTION OF OLEFINIC HYDROCARBONS

David Richard Joy, and Pannalal Sohanlal Jhawar, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 136,547, April 22, 1971, abandoned. This application Nov. 29, 1973, Ser. No. 420,092

Claims priority, application Great Britain, May 8, 1970, 22348/70

Int. Cl. C07c *5/24*

U.S. Cl. 260—666 PY **15 Claims**

1. In a process for the production of a mixture of olefinic hydrocarbons suitable for copolymerisation with ethylene and propylene the following steps in combination,

a. distilling a pyrolysis gasoline fraction derived from a cracked hydrocarbon feedstock to produce a distillate boiling in the range 10° to 80°C comprising piperylene, isoprene and at least one member of the group consisting of cyclopentadiene, dicyclopentadiene, n-pentane, isopentane, pentene-1, trans-pentene-2, 2-methylbutene-2, cyclopentene, cyclopentane and benzene,

b. redistilling said distillate to produce an isoprene concentrate and a piperylene concentrate, the latter including piperylene and at least one hydrocarbon selected from the group consisting of cyclopentadiene, dicyclopentadiene, n-pentane, transpentene-2, 2-methylbutene-2, cyclopentene, cyclopentane and benzene,

c. heating said piperylene concentrate at a temperature of at least 150°C for a period of time up to 24 hours with added cyclopentadiene or dicyclopentadiene if one or other of these latter is not present in sufficient amount so as to codimerise said piperylene and cyclopentadiene and produce a mixture of olefinic hydrocarbons including 2-propen-1-yl-norbornene-5, said mixture being suitable for polymerisation with ethylene and propylene.

3,855,327

HYDROGENATION OF UNSATURATED COMPOUNDS

William G. Billings, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 8, 1971, Ser. No. 160,886

Int. Cl. C07c *5/18*, *5/04*

U.S. Cl. 260—668 D **5 Claims**

1. A process for converting 4-vinylcyclohexene-1 to ethylcyclohexene and ethylbenzene which comprises contacting same with hydrogen in the presence of a pyridine-organocopper catalyst product which is a solid crystalline precipitate separated from the reaction product obtained by reacting cuprous halide, pyridine, and a weak organic acid in the presence of carbon monoxide.

3,855,328

ISOMERIZATION AND/OR TRANSALKYLATION AND/OR DISPROPORTIONATION OF ALKYLNAPHTHALENES

John A. Hedge, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

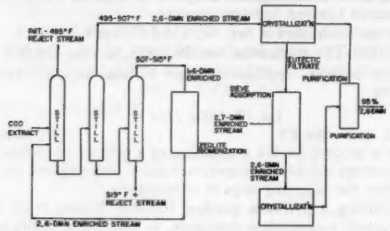
Filed Dec. 14, 1971, Ser. No. 207,870

Int. Cl. C07c *5/24*, *3/62*

U.S. Cl. 260—668 A **13 Claims**

1. Process for isomerization, disproportionation or transalkylation of a feed consisting essentially of methyl naphthalenes comprising contacting said feed, at a conversion temperature, with a crystalline zeolite catalyst containing cations of

lanthanum or at least one rare earth metal, said zeolite catalyst having a framework with an atomic ratio Al/Si in the range of



0.35–1.0 and containing in the range of 2–12 wt. percent water which can be evolved on ignition analysis at 1,900°F.

3,855,329

OLEFIN COUPLING IN THE PRESENCE OF PALLADIUM CARBOXYLATES

Robert S. Shue, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 214,399, Dec. 30, 1971, Pat. No. 3,775,511. This application Mar. 8, 1973, Ser. No. 338,809

Int. Cl. C07c *15/12*

U.S. Cl. 260—668 R **4 Claims**

1. A process for olefin coupling comprising contacting styrene with a palladium(II) carboxylate coupling promoter in the presence of an inert solvent and oxygen wherein the pressure of said oxygen is at least about 50 psig.

3,855,330

PRODUCTION OF STYRENE

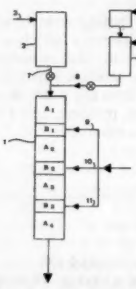
Jean Claude Mendelsohn, Sauveterre De Bearn, and Jean Henri Blanc, Pau, both of France, assignors to Societe Nationale Des Petroles D'Aquitaine, Courbevoie, France

Filed Sept. 20, 1972, Ser. No. 290,440

Claims priority, application France, Sept. 23, 1971, 71.34180; Sept. 8, 1972, 72.31869

Int. Cl. C07c *5/18*

U.S. Cl. 260—669 R **9 Claims**



1. In a process for the production of styrene by contacting gaseous ethylbenzene with a dehydrogenation catalyst selected from the group consisting of iron oxide; cobalt oxide; mixture of iron oxide or cobalt oxide with an alkaline compound of potassium or chromium oxide; mixture of iron oxide with an alkali metal oxide; mixture of iron oxide with an alkali metal oxide and chromium oxide; mixture of iron oxide, chromium oxide, potassium carbonate and a phosphate of an alkali metal or alkaline earth metal; mixture of iron oxide, zinc oxide or magnesium oxide with chromium or copper salt and potassium oxide or potassium carbonate; mixture of iron oxide, zinc oxide or magnesium oxide with a chromium or copper salt, and potassium oxide or potassium carbonate, and a vanadium compound and an oxidation catalyst selected from the group consisting of palladium, platinum, mixture of palladium and platinum, salts of palladium and platinum, and oxides of palladium and platinum, and introducing oxygen into the reaction medium, the improvement which comprises disposing the oxidation catalyst in a zone between zones containing the dehydrogenation catalyst, and introducing oxygen only into the oxidation catalyst zone.

3,855,331

VINYL XYLENES AND METHOD

James H. Moss, Jr.; Calvin L. Daniels, and Cleve H. Forward, all of Big Spring, Tex., assignors to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Feb. 5, 1973, Ser. No. 329,831

Int. Cl. C07c *5/18, 3/52*

U.S. Cl. 260—669 R **6 Claims**

1. The method of forming ethyl xylenes with the ethyl group predominantly attaching non-adjacent in its ring position to the methyl groups on the benzene ring comprising alkylating a xylene selected from the group consisting of ortho-xylene, meta-xylene, mixtures thereof and mixtures thereof containing para-xylene, with ethylene in the presence of an anhydrous aluminum chloride Friedel-Crafts catalyst promoted with hydrochloric acid or its water equivalent at a temperature in the range of about 75° to 100°C.

3,855,332

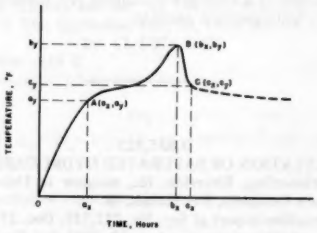
PROCESS FOR PRODUCTION OF POLYARYLENES

Chen-Shen Wang, Naperville, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 169,367, Aug. 5, 1971, abandoned. This application Dec. 12, 1972, Ser. No. 314,424

Int. Cl. C07c *15/12*

U.S. Cl. 260—670 **12 Claims**

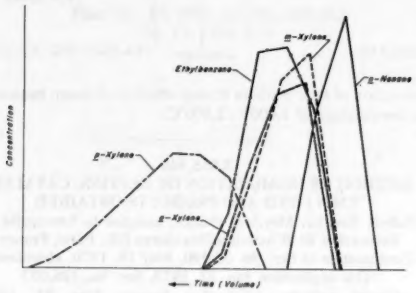


1. A process for the preparation of branched polyarylenes which comprises treating an aromatic hydrocarbon, a partially hydrogenated aromatic hydrocarbon, or a mixture of an aromatic hydrocarbon and a partially hydrogenated aromatic hydrocarbon with an active carbon whose surface area is at least about 1500 m^2/g in the presence of hydrogen and at a temperature of at least 800°F.

3,855,333
ADSORPTIVE SEPARATION OF AROMATIC ISOMERS WITH ADSORBENTS CONTAINING AN ALCOHOL SUBSTRATE

Richard W. Neuzil, Downers Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Mar. 19, 1973, Ser. No. 342,658
Int. Cl. C07c 7/12
U.S. Cl. 260—674 SA **19 Claims**



1. A process for separating the para-isomer from a feed comprising a mixture of bi-alkyl substituted monocyclic aromatic isomers, including the para-isomer, which process comprises contacting said mixture with a crystalline aluminosilicate adsorbent containing barium at exchangeable cationic sites within the adsorbent crystalline structure and additionally containing, during sid contacting, from about 0.1 to about 8.0 wt. percent of an alcohol at adsorption conditions to effect the selective adsorption of said para-isomer by said adsorbent and recovering from said adsorbent a stream concentrated in said para-isomer.

3,855,334
SEPARATION OF 2,6-DIMETHYLNAPHTHALENE BY COMPLEXATION

Howard P. Angstadt, Media, Pa., assignor to Sun Ventures, Inc., St. Davis, Pa.

Filed Oct. 29, 1973, Ser. No. 410,649
Int. Cl. C07c 7/02
U.S. Cl. 260—674 N **8 Claims**

1. Method of separating 2,6-DMN from a liquid mixture of 2,6-DMN and at least one other alkylnaphthalene which comprises

a. contacting said mixture with 2-cyano-6-methylnaphthalene for a time sufficient for the latter to selectively complex with the 2,6-DMN,
b. recovering the 2,6-DMN:2-cyano-6-methylnaphthalene complex, and
c. recovering 2,6-DMN from the complex in a higher purity than in said liquid mixture.

3,855,335
METHOD OF STEAM DEALKYLATION

John H. Estes; Edwin R. Kerr, and Tansukhlal G. Dorawala, all of Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 14, 1973, Ser. No. 424,980
Int. Cl. C07c 3/58
U.S. Cl. 260—672 R **19 Claims**

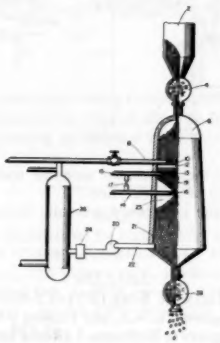
1. The method of steam dealkylating an alkylaromatic hydrocarbon charge which comprises

passing a mixture of steam and an alkylaromatic hydrocarbon, at steam dealkylating conditions, into contact with an activated catalyst consisting essentially of a massive metal screen containing at least about 50 percent nickel thereby forming a product gas containing dealkylated alkylaromatic hydrocarbon; and
recovering said product gas.

3,855,336
PROCESS FOR THE PRODUCTION OF SYNTHESIS GAS, CRACKED HYDROCARBON AND CALCINED COAL

La Vaun S. Merrill, Jr., Englewood, and Robert E. Schilson, Littleton, both of Ohio, assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 265,915, June 23, 1972, abandoned, which is a continuation-in-part of Ser. No. 857,517, Sept. 12, 1969, Pat. No. 3,676,517. This application Aug. 23, 1973, Ser. No. 391,000The portion of the term of this patent subsequent to July 11, 1989, has been disclaimed.
Int. Cl. C07c 11/24
U.S. Cl. 260—679 R **19 Claims**



1. In a calcination process comprising passing coal through a combustion zone in the presence of an oxidant wherein about 2 to about 25 weight percent of the coal is permitted to oxidize, thereby heating the remaining coal to an average temperature within the range of about 2000°F. to about 2500°F. and producing combustion gases comprising N_2, Ar, CO_2, H_2O and CO, and then passing the heated coal through a calcination zone to obtain calcined coal, the step comprising passing at least a portion of the combustion gases through the heated coal and simultaneously introducing steam, hydrocarbon, or steam and hydrocarbon into the heated coal at a temperature sufficient to obtain cracking of the hydrocarbon and removing the resulting synthesis gases, cracked hydrocarbons, and the calcined coal.

3,855,337
METHOD OF REMOVING AND RECOVERING AROMATIC HYDROCARBONS AND WATER FROM A GAS STREAM

Adolph J. Foral, Jr., and Phillip N. Batdorf, both of Houston, Tex., assignors to Black, Sivalls & Bryson, Inc., Houston, Tex.

Filed Oct. 17, 1973, Ser. No. 407,077
Int. Cl. C07c 7/00
U.S. Cl. 260—674 R **20 Claims**

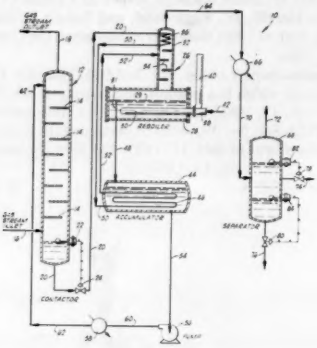
1. A method of removing and recovering aromatic hydrocarbons and water from a gas stream which comprises the steps of:

a. intimately contacting said gas stream with a stream of liquid absorbent so that aromatic hydrocarbons and water contained therein are selectively and simultaneously absorbed and removed therefrom;
b. heating the resultant stream of water and aromatic hydrocarbon rich liquid absorbent in a reboiler so that the absorbed aromatic hydrocarbons and water are vaporized

and separated therefrom and the stream of liquid absorbent is reconcentrated;

c. withdrawing the separated aromatic hydrocarbons and water vapor;

d. recycling the reconcentrated liquid absorbent stream into intimate contact with said gas stream;



e. condensing the withdrawn aromatic hydrocarbons and water vapors of step (c); and

f. separating the condensed aromatic hydrocarbons from the water.

3,855,338
PREPARATION OF 6-METHYL-1,5-HEPTADIENE

Peter Fitton, Pequannock, N.J., and Thomas Whitesides, Madison, Wis., assignors to Hoffmann-LaRoche Inc., Nutley, N.J.

Filed Oct. 24, 1973, Ser. No. 409,122
Int. Cl. C07c *3/62*
U.S. Cl. 260—680 R **11 Claims**

1. A process for preparing 6-methyl-1,5-heptadiene comprising reacting isobutene with an olefin component containing a compound of the formula:

$$R_1—CH=CH—CH_2—CH=CH—R_2$$

wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, lower alkyl or $R_3—CH=CH—CH_2—CH—$ or taken together form lower alkylene or $—CH_2—CH_2—CH=CH—CH_2—CH_2—$; and R_3 is lower alkyl;

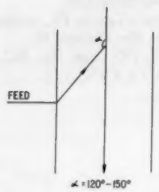
or mixtures of said compounds in the presence of a catalyst system containing activated rhenium oxide on alumina and tetra(lower alkyl)metal wherein the metal is a Group IV-A metal.

3,855,339
PROCESS FOR THE THERMAL CRACKING OF HYDROCARBONS

Takuji Hosoi, 4-513, Hyakunin-cho, Shinjuku-ku, Tokyo; Masaaki Kanbayashi, 154-1, Harada, Nishiki-machi; Koichi Washimi, 1-6, Ochiai, Nishiki-machi, both of Iwaki-shi, Fukushima-ken, and Shimpei Gomi, 1-6, Nakamura, Nerima-ku, Tokyo, all of Japan

Continuation-in-part of Ser. No. 163,420, July 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 792,170, Jan. 17, 1969, abandoned. This application Aug. 14, 1973, Ser. No. 388,174
Claims priority, application Japan, Jan. 25, 1968, 43-4035
Int. Cl. C07c *3/30*
U.S. Cl. 260—683 R **3 Claims**

1. A process for the thermal cracking of hydrocarbons in a vertical, cylindrical cracking reactor comprising introducing a raw hydrocarbon material of, or containing components of, low volatility into the reactor in the form of a spray of liquid droplets in such a manner that the material is injected linearly in the radial direction toward the center axis of the reactor and counter-current at an angle of 120° to 150° to the passing



direction of heat medium stream which is of steam heated to a temperature of 1,600° – 2,300°C.

3,855,340
METHOD OF DISMUTATION OF OLEFINS, CATALYST EMPLOYED AND PRODUCTS OBTAINED

Hubert Knoche, Meyzieu, France, assignor to Entreprise De Recherches Et D'Activites Petrolieres Elf., Paris, France

Continuation of Ser. No. 38,490, May 18, 1970, abandoned. This application Jan. 23, 1973, Ser. No. 326,073
Claims priority, application France, May 22, 1969, 69.16711
Int. Cl. C07c *3/62*
U.S. Cl. 260—683 D **4 Claims**

1. A method of dismutation of olefins, the reaction being carried out in homogeneous phase by contact of said olefin with a catalyst consisting of a mixture of an alcolate having the formula:

$$X[o]_n[O\text{-}R]_{1-2n}$$

where X is tungsten or molybdenum, R a remainder of alkyl or aryl hydrocarbide, n being equal to 0 or 1 and 1 being equal to 5 or 6 with halogenated aluminum organometallic compound as a metal organic reducing agent, the relative molar proportions of metal organic reducing agent and alcoholate being between 6 and 12 for the ratio Al/Mo and Al/W.

3,855,341
PROPYLENE OLIGOMERIZATION PROCESS

John F. Motier, Dolton, and Jin Sun Yoo, South Holland, both of Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed Apr. 29, 1969, Ser. No. 820,302
Int. Cl. C07c *3/10*
U.S. Cl. 260—683.15 D **2 Claims**

1. In a process for polymerizing propylene to dimers through tetramers, the improvement which comprises conducting said polymerization in contact with a catalyst comprising a complex of

A. zirconium acetylacetonate;

B. an electron donor ligand phosphine of the formula R_3P wherein each R is a hydrocarbon of up to 20 carbon atoms selected from the group consisting of alkyl, aryl, alkaryl, aralkyl and cycloalkyl, with

C. a combination of a reducing agent capable of reducing zirconium acetylacetonate to an oxidation state of less than 4 and a non-protonic Lewis acid capable of forming a coordination bond with zirconium selected from a compound represented by the formula

$$R'_{(n-y)}MX_y$$

wherein R′ is alkyl of 2 to about 6 carbon atoms, X is chlorine, M is a metallic element of coordination number n′ whose halides are Lewis acids selected from aluminum, magnesium, beryllium, lead, zinc and tin and y is a number having a value of from greater than 0 to n′; the molar ratio of (B) to (A) being about 2 to 7:1 and the molar ratio of (C) to (A) being about 10 to 20:1, said components (C) and (A) being combined to reduce zirconium represented by (A) to an oxidation state of less than 4, and form a coordination bond with (A),

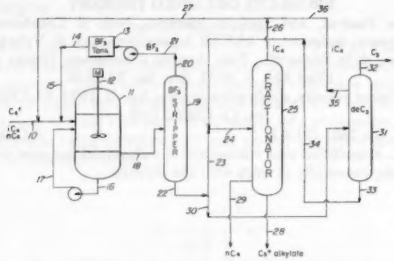
and recovery of a polymerized propylene hydrocarbon product containing at least one dimer through tetramer.

3,855,342

ISOPARAFFIN-OLEFIN ALKYLATION WITH A COMPLEX OF A MACRORETICULAR ACID CATION EXCHANGE RESIN AND BF_3

Tracy J. Huang, Trenton, N.J., and Sergei Yurchak, Washington Crossing, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 25, 1973, Ser. No. 409,563
Int. Cl. C07c 3/56
U.S. Cl. 260—683.44 **20 Claims**



1. In a process for alkylating an isoparaffin having from 4 to 8 carbon atoms with an olefin containing from 2 to 12 carbon atoms by contacting said isoparaffin and said olefin in the liquid state in an alkylation reaction zone maintained at a temperature between about −20°and 150°C. with a catalyst comprising a cation exchange resin containing acid groups and boron trifluoride, said boron trifluoride being present in said reaction zone in an amount in excess of that needed to saturate said resin to form the resin. BF_3 complex, the molar ratio of said isoparaffin to said olefin being between about 2 and 50, withdrawing a hydrocarbon product mixture from said reaction zone and separating an alkylate hydrocarbon product from said mixture, the improvement wherein said resin consists essentially of a macroreticular acid cation exchange resin characterized by a water content between about 0.5 and about 20 weight percent, a surface area of at least 30 square meters per gram and a surface acid concentration of between 0.001 and about 0.5 milliequivalents of hydrogen ion per square meter surface area.

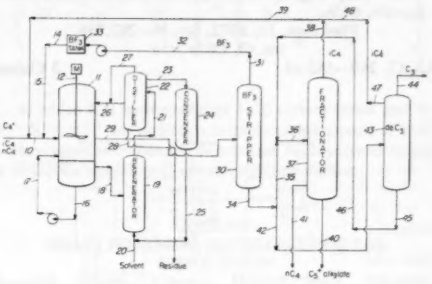
3,855,343

ISOPARAFFIN-OLEFIN ALKYLATION WITH REGENERATION OF RESIN/BORON TRIFLUORIDE CATALYST

Tracy J. Huang, Trenton, N.J., and Sergei Yurchak, Washington Crossing, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,248
Int. Cl. C07c 3/52
U.S. Cl. 260—683.44 **20 Claims**

1. An alkylation process which includes regeneration of a spent marcoreticular acid cation exchange resin characterized by a water content between about 0.5 and about 20 weight percent and a surface acid concentration of between 0.001 and about 0.5 milliequivalents of hydrogen ion per square meter surface area which comprises extracting said resin with a polar solvent, separating the spent resin so regenerated from said solvent and reusing the regenerated resin in the process which led to its deactivation, said process comprising alkylating an isoparaffin having from 4 to 8 carbon atoms with an olefin containing from 2 to 12 carbon atoms by contacting said isoparaffin and said olefin, in the liquid state with a catalyst in an alkylation reaction zone maintained at a temperature between about −20°C. and 150°C., said catalyst comprising a complex of said resin and boron trifluoride, said boron trifluoride being present in an amount in excess of that needed to saturate the resin to form said complex, the molar ratio of said



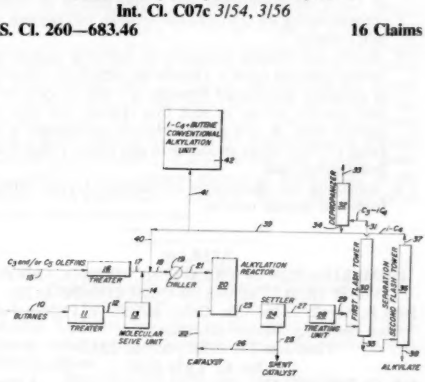
isoparaffin to said olefin being between about 2 and 50, withdrawing a hydrocarbon product mixture from said reacting zone and separating an alkylate hydrocarbon product from said mixture.

3,855,344

ISOBUTANE FLASHING IN THE ALKYLATION OF C_2–C_5 OLEFIN HYDROCARBONS WITH ISOBUTANE

Edwin K. Jones, 350 Melrose Ave., Kenilworth, Ill. 60043

Filed Feb. 2, 1973, Ser. No. 328,903
Int. Cl. C07c 3/54, 3/56
U.S. Cl. 260—683.46 **16 Claims**



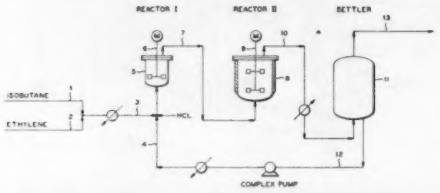
1. In the alkylation of isobutane with C_2, C_3 and/or C_5 olefins, the improvement comprising, removing n-butane from a paraffin feed stock containing a major proportion of isobutane, alkylating said isobutane-containing feed stock, containing essentially no n-butane, with an olefin alkylating agent, essentially free of n-butane, selected from the class consisting of ethylene, propylene, amylenes and mixtures thereof, in the presence of an acid catalyst, separating the catalyst from the alkylation reaction mixture, flashing the catalyst-free alkylation reaction mixture to remove a portion of the unreacted isobutane as an overhead fraction and to separate the alkylate and the remaining unreacted isobutane as a bottom fraction, flashing said alkylate and said remaining unreacted isobutane to remove a major proportion of said remaining unreacted isobutane as an overhead fraction, withdrawing said alkylate, and recycling the recovered isobutane.

3,855,345

ALKYLATION OF ISOBUTANE WITH ETHYLENE AND WITH ALUMINUM HALIDE HYDROCARBON COMPLEX CATALYST USING TWO REACTORS IN SERIES

Thomas Hutson, Jr., and Donald J. Makovec, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 11, 1972, Ser. No. 287,736
Int. Cl. C07c *3/56*
U.S. Cl. 260—683.45 **3 Claims**



1. A method for producing diisopropyl-containing alkylate by the alkylation of isobutane and ethylene feedstock in the presence of an aluminun halide hydrocarbon complex catalyst while maintaining a balance of maximum product research octane number (RON) and maximum ethylene feed conversion efficiency said method comprising:

a. feeding isobutane, ethylene and aluminum halide into a first agitated reactor wherein the feedstock and catalyst are intimately mixed with high agitation wherein the contact energy of the agitator is maintained in the range of 15 to 30 horsepower per 1,000 gallons of reactor content during the contact time between said agitator and said content,

b. feeding the effluent stream from said first reactor to a second agitated reactor wherein the effluent is subjected to agitation maintained between 0.1 and 50 percent of said contact energy in said first reactor and with the contact time in said second reactor maintained in the range of 2 to 6 times greater than said contact time in said first reactor, and

c. collecting the diisopropyl-containing alkylate effluent from said second reactor.

3,855,346

ISOMERIZATION OF PARAFFINIC HYDROCARBONS WITH TRIFLUOROMETHANESULFONIC ACID

John R. Norell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 28, 1972, Ser. No. 221,777
Int. Cl. C07c *5/30*
U.S. Cl. 260—683.68 **3 Claims**

1. A process for the isomerization of paraffinic hydrocarbons which comprises contacting a feed comprising paraffinic hydrocarbons in a conversion zone at isomerization conditions with a catalyst consisting of trifluoromethanesulfonic acid.

3,855,347

PROCESS FOR HYDROGENATING HALOGENATED HYDROCARBONS

F. Frederick Oricchio, Duxbury, Mass., assignor to The Badger Company, Inc., Cambridge, Mass.

Division of Ser. No. 289,243, Sept. 15, 1972, abandoned. This application Dec. 6, 1973, Ser. No. 422,405
Int. Cl. C07c *1/26*
U.S. Cl. 260—683.9 **12 Claims**

1. A process for hydrogenating halogenated hydrocarbons by contacting the same, in admixture with hydrogen and under hydrogenation conditions, with a catalyst, the preparation of which comprises (1) impregnating the particles of a silica-alumina powder with a hydrogen halide acid - water solution of a Group VIII metal halide, (2) heating the resulting particles to a temperature between about 175° and 300°F for a period sufficient to evaporate excess solution and dry said particles, placing said dried particles in a reactor so as to form a bed and (3) activating said dried particles by fluidizing said bed with a gas stream that comprises hydrogen and an inert gas at a temperature between about 550° and 900°F, for a period sufficient to reduce the metal halide on said dried particles.

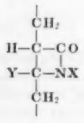
3,855,348

METHOD FOR THE CHEMICAL MODIFICATION OF ETHYLENICALLY UNSATURATED POLYMERS AND PRODUCTS OBTAINED THEREBY

Rene Pautrat, and Jacques Marteau, both of Courbevoie, France, assignors to ANVAR Agence Nationale de Valorisation de la Recherche, Tour Aurore, Courbevoie, France

Filed Apr. 5, 1972, Ser. No. 241,438
Claims priority, application France, Apr. 8, 1971, 71.12504
Int. Cl. C08f *27/08*
U.S. Cl. 260—79.3 R **4 Claims**

1. A modified non vulcanized or vulcanized polymer consisting essentially of units with the formula



(I)

wherein Y is a hydrogen atom, a halogen atom, an alkyl group or an aryl group, and X is sulfochloride group SO_2Cl, as produced by the method comprising reacting an ethylenically unsaturated polymer containing $-CH_2-C(Y)=CH-CH_2-$ units, wherein Y is a hydrogen atom, a halogen atom, an alkyl group or an aryl group, with chlorosulfonyl isocyanate, $ClO_2S-N=C=O$), in the absence of oxygen and moisture, at temperatures between −20°C and +150°C, in a dry solvent or mixture of solvents inert towards chlorosulfonyl isocyanate, the concentration of the said unsaturated polymer in the solution being 1% to 15% by weight, without a catalyst.

3,855,349

METHOD AND COMPOSITION FOR IMPARTING FIRE-ROOFNESS TO SYNTHETIC SHAPED ARTICLES

Masakazu Date, and Shigeki Fukuoka, both of Takatsuki, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Kita-ku, Osaka, Japan

Filed Mar. 17, 1972, Ser. No. 235,861
Claims priority, application Japan, Mar. 22, 1971, 46-16614; Dec. 21, 1971, 46-104421
Int. Cl. D06m *13/28, 13/44*
U.S. Cl. 260—849 **1 Claim**

1. A composition for imparting fire-proofness to a shaped article of a synthetic resin, which comprises 100 parts by weight of (1) (a) a water-soluble precondensate of a tetrakis hydroxymethyl phosphonium compound and urea or (b) a water-soluble precondensate of a tetrakis hydroxymethyl phosphonium compound, urea and melamine or guanidine in which the ratio of the amount of the methylol groups in the tetrakis hydroxymethyl phosphonium compound to the total amount of the amino groups in the urea, melamine and guanidine is an equivalent ratio of 1:0.1 to 0.5, (2) 2 to 20 parts by weight of a compound selected from the group consisting of urea, thiourea, guanidine carbonate, guanidine phosphate and guanidine hydrochloride and (3) 2 to 15 parts by weight of a methylol resin precondensate having at least one methylol group in the molecule selected from the group consisting of

methylolmelamine resin, methylolurea resin, methyloluron resin, methyloltriazone resin, methylolethyleneurea resin, methylolpropyleneurea resin and methylolhydroxyethyleneurea resin.

3,855,350

POLYAMIDES AND POLYOXAMIDES COPOLYMERIZED IN THE PRESENCE OF A GLYCOL

Joseph Oldham, Blackley, England, and Frederick Keith Duxbury, deceased, late of Blackley, England (by Jean Duxbury, administratrix), assignors to Imperial Chemical Industries Limited, London, England

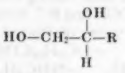
Filed Dec. 22, 1971, Ser. No. 211,122

Claims priority, application Great Britain, Dec. 22, 1970, 60902/70

Int. Cl. C08g *41/04*

U.S. Cl. 260—857 TW **29 Claims**

1. A process for the manufacture of a high molecular weight composition which comprises condensing a diamine with an ester of oxalic acid in the presence of a glycol, and in the presence of from 10% to 80% by weight of a polyamide said polyamide being in solution in said glycol, the glycol having the following formula:



wherein R represents a hydrogen atom, a lower alkyl group having from 1 to 4 carbon atoms or a hydroxymethyl group by heating at a temperature sufficient for copolymerization of said polyamide with said glycol, but in any event at a temperature not greater than 180°C, said polyamide being a polyamide obtained by polymerizing an amino carboxylic acid or its derivative lactam in which there are at least two carbon atoms between the amino and carboxylic acid group, or by condensing substantially equimolecular proportions of a diamine which contains at least two carbon atoms between the amino groups with a dicarboxylic acid other than oxalic, the proportion of glycol to the total of said polyamide and said ester of oxalic acid being between 30:1 and 2:1 by weight acid.

3,855,351

DI (2-PHENOXYETHYL) PEROXYDICARBONATE

Jose Sanchez, Grand Island, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 209,435, Dec. 17, 1971,. This application Oct. 24, 1973, Ser. No. 409,128

Int. Cl. C08f *2/00*

U.S. Cl. 260—861 **3 Claims**

1. In a process for curing a mixture of an unsaturated polyester of a dicarboxylic or polycarboxylic acid or its anhydride and an ethylenically unsaturated monomer by heating at a curing temperature in the presence of a curing catalyst, the improvement which comprises employing di-(2-phenoxyethyl) peroxydicarbonate as the curing catalyst.

3,855,352

PHOSPHORUS-CONTAINING POLYMERS

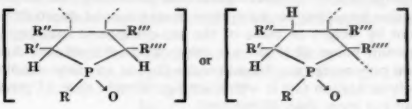
Kurt Moedritzer, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed July 17, 1972, Ser. No. 272,239

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 **6 Claims**

1. A composition of matter consisting essentially of a polymer of the class consisting of polyhexamethylene adipamide, poly-epsilon caproamides, polyhexamethylene sebacamide, polyethylene terephthalate, acrylonitrile, styrene, butadiene-styrene, vinylchloride, vinylidene chloride, vinyl acetate and isobutylene having incorporated therewith a phospholene oxide polymer characterized by the repeating units



in which R is hydrocarbyl of 1–20 carbon atoms and R′, R″, R‴, R⁗ are hydrogen or hydrocarbyl groups of 1–20 carbon atoms with the said phospholene oxide polymer having a molecular weight ranging from 200 to 1 million.

3,855,353

GRAFT POLYMERS BASED ON ETHYLENE COPOLYMERS

Heinrich Alberts, Cologne; Herbert Bartl, Odenthal-Hahnenberg, and Rainer Kuhn, Berg. Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 26, 1973, Ser. No. 344,544

Claims priority, application Germany, Mar. 30, 1972, 2215588

Int. Cl. C08f *15/00*

U.S. Cl. 260—878 R **11 Claims**

1. A process for the production of a graft polymer from ethylene-vinyl ester copolymers and olefinically unsaturated compounds in the presence of a radical former in homogeneous or heterogeneous phase, wherein a mixture of acrylonitrile, methacrylonitrile or a mixture thereof, at least one aromatic monovinyl compound, at least one monoolefin containing 2 to 18 carbon atoms, 0–30% by weight of another vinyl compound selected from the group consisting of acrylic acid esters and methacrylic acid esters with 1 to 8 carbon atoms in the alcohol component, acrylamide, methacrylamide, acrylic acid, methacrylic acid, vinyl esters of organic saturated monocarboxylic acids containing 2 to 18 carbon atoms and mixtures thereof and 0–15% by weight of an allyl compound selected from the group consisting of allyl alcohol, allyl acetate, isobutene diacetate and mixtures thereof is polymerized in the presence of a copolymer of ethylene with a vinyl ester of an organic monocarboxylic acid.

3,855,354

PROCESS FOR THE PREPARATION OF THERMOPLASTIC POLYMERS

Hidehiko Takizawa, and Mituto Hisashige, both of Chiba, Japan, assignors to Denki Kogaku Kogyo Kabushiki Kaishi, Tokyo, Japan

Filed Nov. 14, 1972, Ser. No. 306,486

Claims priority, application Japan, Nov. 16, 1971, 46-91806

Int. Cl. C08f *1/60;* **c08f** *19/08;* **C08f** *1/04*

U.S. Cl. 260—880 R **7 Claims**

1. In a two step process for the preparation of styrene type thermoplastic polymers from a composition comprising 2 to 15 percent of an elastomer, 5 to 35 percent of acrylonitrile and 50 to 93 percent of an aromatic vinyl compound or a mixture of said aromatic vinyl compound with up to 15 percent of another compound other than acrylonitrile copolymerizable with said aromatic vinyl compound, said per cents being by weight, utilizing an organic peroxide catalyst in the first step and azo-compound catalyst in the second step, by carrying out the first step of polymerization until the polymerization rate becomes any value within a range of 10 to 40 percent and subsequently carrying out the second step of polymerization, the improvement comprising in carrying out the first step of polymerization by adding to the polymerization system 0.01 to 0.15 percent by weight of the organic peroxide catalyst, said amount of organic peroxide catalyst being all of the or-

ganic peroxide catalyst used during said polymerization, based on the feed at any time when the polymerization rate is within a range of 0 to 15 percent, and then continuing said polymerization by adding to the system in said second step 0.01 percent by weight or more of the azo-compound catalyst, said amount being all of the azo-compound catalyst used during said polymerization, based on the feed at any time when the polymerization rate is within a range of more than 15 percent and not more than 40 percent.

3,855,355

PROCESS FOR PREPARING GRAFT COPOLYMERS IN AQUEOUS EMULSION

John David Moore, Southampton, England, assignor to The International Synthetic Rubber Company Limited, Southampton, England

Filed May 11, 1972, Ser. No. 252,225

Claims priority, application Great Britain, May 14, 1971, 15073/71

Int. Cl. C08f *19/08, 19/18, 1/13*

U.S. Cl. 260—880 R **11 Claims**

1. A process for preparing an acrylonitrile-butadiene-styrene (ABS) graft copolymer from a rubbery polybutadiene latex characterized by the steps of:

1. admixing some or all of the styrene to be grafted, with the latex in the absence of acrylonitrile, the amount of styrene being at least 30 parts by weight per 100 parts of rubber,
2. contacting the mixture so formed after an imbibing time of from 5 minutes to 20 hours before reaction is initiated with acrylonitrile and the balance, if any, of the styrene, and
3. then initiating and continuing aqueous emulsion graft polymerization of the styrene and acrylonitrile in said mixture on to the polybutadiene steps (1) and (2) taking place before the initiation of graft polymerization in step (3).

3,855,356

FLAME RETARDANT POLYMER COMPOSITION

John B. Luce, Mount Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 215,155, Jan. 3, 1972, Pat. No. 3,796,772. This application Oct. 15, 1973, Ser. No. 406,603

Int. Cl. C08d *7/10;* **C08f** *45/56*

U.S. Cl. 260—881 **2 Claims**

1. A flame retardant polymer composition comprising in admixture, a vinyl aromatic-acrylonitrile-butadiene terpolymer, 5–30 weight percent of a halogen containing flame retardant additive and 0.01 to about 20.0 weight percent of a titanate selected from calcium and nickel titanates, and mixtures of these titanates; said halogen being selected from the group consisting of bromine and chlorine.

3,855,357

WIRE AND CABLE INSULATION COMPRISING VINYL CHLORIDEPOLYMER AND LACTONE GRAFT COPOLYMER

Edward B. Harris, Spring Valley, N.Y., and David B. Braun, Ridgefield, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,303

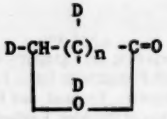
Int. Cl. C08f *29/24*

U.S. Cl. 260—897 C **10 Claims**

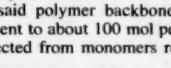
1. Wire and cable insulation having enhanced abrasion, oil and solvent resistance comprising:

1. A normally solid vinyl chloride polymer containing at least about 80 percent by weight of vinyl chloride polymerized therein and from 0 to about 20 percent by weight of an ethylenically unsaturated comonomer capable of copolymerizing with vinyl chloride; and

2. about 40 to about 80 parts by weight per hundred parts of vinyl chloride polymer of a graft copolymer of a lactone having the formula:



wherein n is an integer having values of from about 3 to about 6 wherein at least n + 2 D's are hydrogen and wherein the remaining D's are lower alkyl groups having up to about 8 carbon atoms, said lactone being graft polymerized onto a reactive organic polymer backbone of ethylenically unsaturated monomers, said polymer backbone containing from about 0.1 mol percent to about 100 mol percent of polymerized monomer selected from monomers represented by the formulae:



R being hydrogen, alkyl having from 1 to about 3 carbon atoms or CH_2COOH and R''' being —OH, OC_pH_{2p} OH in which p has a value of from 1 to about 5 or higher, $-C_pH2pNH_2$, $-OC_pH_{2p}COOH$, $-NH_pH_{2p}OH$, $-NHC_pH_{2p}NH2$, $-NHC_pH_{2p}COOH$, $-OC_pH_{2p}$ NHR'''' or $—NHC_pH_{2p}$ NHR'''' wheel R'''' is alkyl having up to about 10 carbon atoms or more.

3,855,358

PVC-HEXACHLOROCYCLOPENTADIENE/CYCLIC OLEFIN COPOLYMER RESIN BLENDS

William A. Watts, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 17, 1973, Ser. No. 407,350

Int. Cl. C08f *29/24*

U.S. Cl. 260—899 **11 Claims**

1. Polyvinyl chloride and copolymers of vinyl chloride containing from about 1–99 weight percent of a copolymer resin resulting from the polymerization of (a) 5 to 95 percent by weight of an adduct of hexachlorocyclopentadiene and a cyclic olefin with two or more double bonds, with (b) 95 to 5 percent by weight cyclic olefins.

3,855,359

COPOLYCONDENSED VINYLPHOSPHONATES

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation-in-part of Ser. No. 153,075, June 14, 1971,. This application Oct. 7, 1971, Ser. No. 187,575

Int. Cl. C07f *9/40*

U.S. Cl. 260—928 **19 Claims**

1. A copolycondensed vinylphosphonate consisting essentially of the product resulting from the reaction, in stoichiometric ratio of from about 1:10 to 10:1, between a bis(2-haloalkyl) vinylphosphonate and at least one pentavalent phosphorus ester of the structure ROP(=O)XY where R is selected from the class consisting of c_1–C_{20} alkyl and C_1–C_{20} chloro- or bromoalkyl groups and X and Y are groups selected from the class consisting of RO—, C_1–C_{20} alkyl, C_2–C_{20} alkenyl, phenyl, phenoxy, amino, C_1–C_{20} alkyl substituted amino, phenyl substituted amino, C_2–C_{20} alkylene bonded to the same or to another ROP(=O) moiety and C_2–C_{20} alkyleneoxy and C_2–C_{20} alkylenedioxy bonded to the same or to another ROP(=O) moiety, wherein said reaction is carried out at an elevated temperature for a period of time which is sufficient to evolve R-halide as a by-product and to form a P(O)-O-alkylene-O-P(O) linkage, with the proviso that said product is not the homopolycondensed product of said bis(2-haloalkyl) vinylphosphonate.

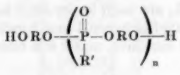
3,855,360

POLYALKYLENE GLYCOL ALKYL OR HALOALKYL POLY-PHOSPHONATES

Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 21, 1972, Ser. No. 282,642
Int. Cl. C07f 9/40; C08g 22/44
U.S. Cl. 260—929 5 Claims

1. A polyalkyl glycol alkyl or haloalkyl polyphosphonate composition characterized by an acid number in water of below 15 mg. of KOH per gram of sample and having the formula:



wherein R is the residue of a polyalkyl glycol having the formula:

HO —R''O—$_x$H

wherein R'' is an alkylene radical of 2 to 20 carbon atoms and x is a number from 2 to about 20, R' is alkyl or haloalkyl and n is a number in the range from about 1 to about 100.

3,855,361

TRANS-1,5-POLYPENTENAMER WITH IMPROVED PROCESSING PROPERTIES

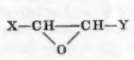
Dieter Maertens, Leverkusen; Josef Witte, Cologne, and Manfred Beck, Odenthal-Gloebusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 198,430, Nov. 12, 1971, abandoned. This application Apr. 25, 1973, Ser. No. 354,180
Claims priority, application Germany, Nov. 14, 1970, 2056178
Int. Cl. C08f 1/28, 7/02
U.S. Cl. 260—93.1 3 Claims

1. A process for producing a predominantly transpolyalkenamer which comprises polymerizing a cyclomonoolefin having four, five or seven to 18 carbon atoms and dissolved in a hydrocarbon solvent in the presence of hydrogen chloride and a catalytic amount of a catalyst comprising

a. a tungsten halide or oxyhalide,

b. a cocatalyst which is selected from the group consisting of di-2-chloro-ethyl formal, diethyl formal and an epoxide of the formula



wherein X is hydrogen, alkyl having one to six carbon atoms, phenyl, tolyl, naphthyl, benzyl or one of said carbon atom containing substituents substituted by methyl or chlorine and Y is hydrogen, alkyl having one to six carbon atoms, phenyl, tolyl, napthyl, benzyl, or one of said carbon atom containing substituents substituted by methyl or chlorine or CH_2—Hal wherein Hal is halogen and

c. an organoaluminum compound of the formula

wherein R_1 is alkyl having one to six carbon atoms and R_2 and R_3 are halogen or alkyl or alkoxy having one to six carbon atoms, the molar ratio of (*a*):(*b*):(*c*) being 1:0.3 to 10:0.5 to 15 and the molar ratio of hydrogen chloride to tungsten being 0.1:1 to 10:1.

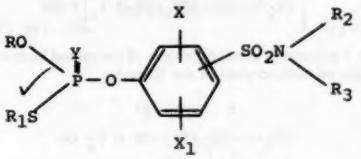
3,855,362

PHOSPHORIC ACID PHENYLSULPHONAMIDE ESTERS

Jozef Drabek, Allschwil, and Denis Varsanyi, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 29, 1972, Ser. No. 310,507
Claims priority, application Switzerland, Dec. 3, 1971, 17619/71; Sept. 22, 1972, 13869/72
Int. Cl. C07f 9/18
U.S. Cl. 260—944 12 Claims

1. A compound of the formula



wherein R represents methyl or ethyl, R_1 represents propyl, n-butyl n-pentyl or $C_2H_5OCH_2CH_2$—, R_2 represents hydrogen, methyl or ethyl, R_3 represents methyl or ethyl, X and X_1 each represents hydrogen or chlorine, and Y represents oxygen or sulphur.

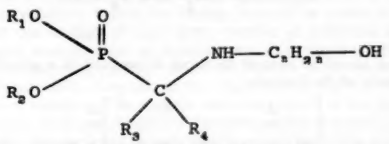
3,855,363

CYCLOALKANE, CYCLOALKENE, AND CYCLOALKANONE PHOSPHONATES

Curtis P. Smith, Cheshire, and Henri Ulrich, Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 8, 1973, Ser. No. 386,520
Int. Cl. C07f 9/40
U.S. Cl. 260—944 3 Claims

1. A compound having the formula:



wherein R_1 and R_2 are each selected from the class consisting of hydrocarbyl from 1 to 12 carbon atoms, inclusive, and halo-substituted hydrocarbyl from 1 to 12 carbon atoms, inclusive;

C_nH_{2n} represents alkylene from 2 to 8 carbon atoms, inclusive, having at least 2 carbon atoms separating the valencies; and

R_3 and R_4, taken together with the carbon atom to which they are attached, represent the residue of a cyclic member selected from the class consisting of a cycloalkane, a cycloalkene and a cycloalkanone each of said cycloalkane, cycloalkene and cycloalkanone having from 4 to 8 ring carbon atoms, inclusive, and having from 0 to 4 lower-alkyl substituents.

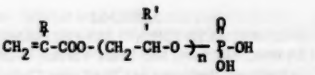
3,855,364

PHOSPHATE ESTERS OF HYDROXYALKYL ACRYLATES AND HYDROXYALKYL METHACRYLATES

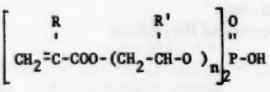
Robert Steckler, Crofton, Md., assignor to Alcolac Inc., Baltimore, Md.

Filed Jan. 5, 1973, Ser. No. 321,229
Int. Cl. C07f 9/08
U.S. Cl. 260—952 7 Claims

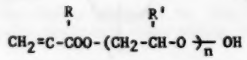
1. The method of making a polymerizable composition of matter comprising essentially of a mixture containing from about 55 percent to about 75 percent of phosphate monoester of the formula:



from about 10 percent to about 25 percent of a phosphate diester of the formula:

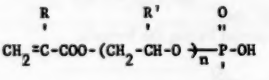


about 3 percent to about 6 percent of unreacted hydroxyalkyl acrylate or methacrylate of the formula:

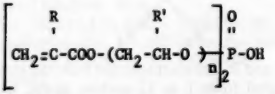


wherein R is selected from the class consisting of hydrogen and methyl, R′ is selected from the class consisting of hydrogen and alkyl of from 1 to 22 carbon atoms, and n is a positive integer of from 1 to 3, and from about 4 percent to about 20 percent of free phosphoric acid; which comprises reacting at a temperature of from 40° to 80°C., in the presence of a small amount of polymerization inhibitor, about 1 to 2 moles of a hydroxyalkyl acrylate or methacrylate of the formula given above, with an amount of polyphosphoric acid equivalent to about 1 mole of P_2O_5.

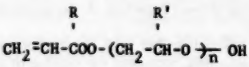
2. Polymerizable composition of matter, when made by the method defined in claim **1**, comprising essentially of a mixture containing from about 55 percent to about 75 percent of phosphate monoester of the formula:



from about 10 percent to about 25 percent of a phosphate diester of the formula:



about 3 percent to about 6 percent of unreacted hydroxyalkyl acrylate or methacrylate of the formula:



wherein R is selected from the class consisting of hydrogen and methyl, R′ is selected from the class consisting of hydrogen and alkyl of from 1 to 22 carbon atoms, and *n* is a positive integer of from 1 to 3; and from about 4 percent to about 20 percent of free phosphoric acid.

3,855,365

HALOBENZYLPHENYL PHOSPHATES

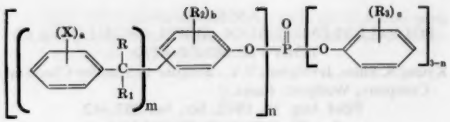
Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 13,783, June 27, 1972, abandoned. This application Sept. 18, 1972, Ser. No. 289,921

Int. Cl. C07f *9/12*

U.S. Cl. 260—966 **13 Claims**

1. Halobenzylphenyl phosphate having a structure corresponding to the formula:



wherein *n* is a number between 0.5 and 2 inclusive; *m* is a number between 1 and 3 inclusive; X is a halogen selected from the group consisting of chlorine and bromine; R and R_1 are each selected from the group consisting of hydrogen and methyl; R_2 and R_3 are each lower alkyl having 1 to 8 carbon atoms; *a* is a number between 1 and 5 inclusive; *b* is a number between 0 and 4 inclusive; and *c* is a number between 0 and 5 inclusive.

3,855,366

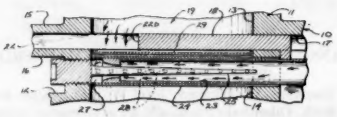
CARBURETOR

Donald L. Chapman, 191 Osceola Ave., Tallmadge, Ohio 44278

Filed Oct. 16, 1972, Ser. No. 298,187

Int. Cl. F02m *9/06*

U.S. Cl. 261—41 B **3 Claims**



1. A carburetor as for a gasoline engine, comprising: a housing having connecting air-intake and gas-mixing chambers, a slide-valve member, adjustably mounted between said chambers, and having a venturi-aperture means of variable flow area therethrough, for passage of air from said air-intake chamber to said gas-mixing chamber with correspondingly varying venturi effect on said air; means for adjusting said slide-valve member to vary the flow area of said venturi aperture means, and a gas metering device presented within said gas-mixing chamber, for supplying gas to said gas-mixing chamber for convergence with said air passed through said venturi aperture means; said gas metering device including relatively movable parts to vary the supply of gas to said chamber, said relatively movable parts of the gas metering device including a relatively fixed tube having therein a plurality of gas metering holes, and a gas supply tube relatively movable with reference to said relatively fixed tube, to open and close one or more said gas metering holes to said gas mixing chamber, said gas supply tube having a gas outlet orifice in a free end thereof presented within said gas mixing chamber; and a tapered stem being affixed to said housing to extend into said gas supply tube through said outlet orifice to vary the effective gas flow area thereof in proportion to relative movement of the supply tube.

3,855,367

VENTURI ANTI-SILTATION SYSTEM

William G. Webb, 280 La Vista Ave., Concord, Calif. 94521

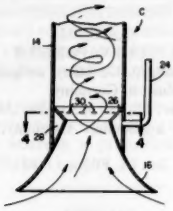
Filed Oct. 25, 1972, Ser. No. 300,636

Int. Cl. B01f *3/04*

U.S. Cl. 261—77 **2 Claims**

1. A circulation and aeration column for drawing accumulated silt off the bottom of a body of water to thereby suspend the silt in the body, comprising: an elongated hollow tube; means for maintaining said tube submerged in said body of water in a substantially vertical orientation, said tube including an upper end and a lower end, the lower end thereof having affixed thereto a cylindrically shaped outwardly flared mouth member, said mouth member tapering inwardly and

terminating within the interior of said tube to provide an opening of lesser cross-section than the cross-section of the opening in said tube; and annular ring member in fluid impervious engagement with the inwardly terminating end of said mouth member, said annular ring member further being outwardly flared to peripherally abut the inner surface of said tube in fluid impervious engagement therewith, thereby forming an annular chamber defined by a portion of the inner surface of said tube, said annular ring member and portion of



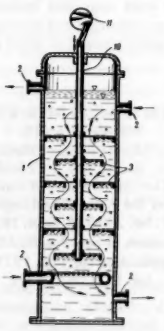
said tapering mouth member disposed within said tube; said annular ring member including a plurality of peripherally spaced inclined apertures; and means for introducing air from an air supply through the wall of said tube into said chamber, whereby when air is discharged through said plurality of inclined apertures, an upwardly advancing, swirling stream will be created in the lower end of said tube to cause silt-laden water to rise upwardly in said tube and be discharged from said upper end thereof.

3,855,368

APPARATUS FOR BRINGING FLUID PHASES INTO MUTUAL CONTACT

Jaroslave Prochazka, and Vladimir Rod, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Praha, Czechoslovakia

Filed Apr. 26, 1972, Ser. No. 247,621
Int. Cl. B01f *3/04*
U.S. Cl. 261—81 **3 Claims**



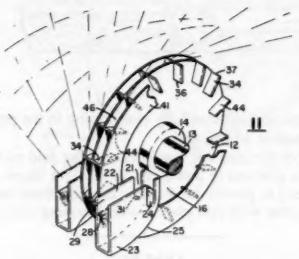
1. Apparatus for bringing fluid phases into mutual contact, comprising, in combination, confining means for confining a fluid phase or phases in an enclosed space; feed means and withdrawing means provided on two opposite sides of said enclosed space for supplying and discharging fluid phases thereinto and thereout, respectively; at least two perforated means disposed above one another in said enclosed space and provided each with alternately spaced apart apertures of two different sizes for passing said fluid phases, the smaller of them designed for passing a dispersed phase or phases, being positioned in one perforated means opposite the larger apertures designed for passing a continuous phase, in both upward and downward adjacent perforated means, wherein the larger apertures are provided with extensions which are disposed tangentially respective to the axis of the enclosed space; and means for bringing the perforated means and said fluid phases into relative reciprocating movement.

3,855,369

LIQUID COOLING APPARATUS

Leonard J. Boler, Minneapolis, Minn., assignor to Cherne Industrial Inc., Edina, Minn.

Filed Jan. 2, 1973, Ser. No. 320,591
Int. Cl. B01f *3/04*
U.S. Cl. 261—90 **12 Claims**



1. Liquid cooling apparatus for projection of liquid drops in trajectories, particle sizes, velocities and volume rates effective for improved cooling of the liquid, said apparatus comprising a plurality of parallel disc-like spray members spaced from each other along a common axis of rotation and having peripheries from which liquid is to be sprayed, said axis of rotation being generally horizontal and perpendicular to said spray members, means for feeding liquid to be cooled to at least one surface of each spray member at a limited area spaced inwardly from its periphery and from which the rotation of the spray member causes the liquid to move centrifugally outwardly along said surface and frictionally in the direction of rotation of the surface, said one surface of the spray member having a plurality of circumferentially-spaced liquid guide vanes projecting axially therefrom and extending generally radially at only the outer portions of said surface between the limited area at which liquid is fed to the surface and the periphery of the spray member for engaging the liquid after it has been fed to said limited area and started to move outwardly along said surface, and a shield member having a splash shield surface extending parallel to said one spray member surface immediately adjacent said vanes over an area extending outwardly from said limited area at which liquid is fed to the spray member surface to that portion of the spray member periphery at which the liquid is projected from the spray member.

3,855,370

MIXER FOR ALGAE PONDS

Joseph C. Dodd, 1150 Alcoa Bldg., Walnut Creek, Calif. 94111

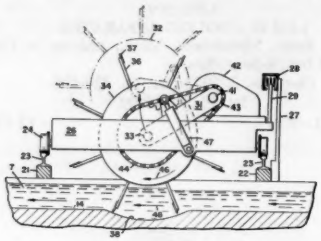
Filed Mar. 16, 1973, Ser. No. 341,878
Int. Cl. B01d *47/16;* **C02c** *1/10*
U.S. Cl. 261—92 **3 Claims**

1. A mixer for algae ponds comprising a plurality of adjacent parallel flow channels separated by upstanding walls;
a support extending transversely across said channels, over said walls,
a carriage selectively movable along said support to positions over each of said channels;
a paddle wheel device mounted on said carriage in a position to extend into a channel over which said carriage is

positioned and being rotatable about an axis transverse to said channels;

means on said carriage for rotating said paddle wheel to induce liquid in said channels to flow therealong;

each of said channels having a concavely curved bottom surface portion extending transversely thereof parallel to



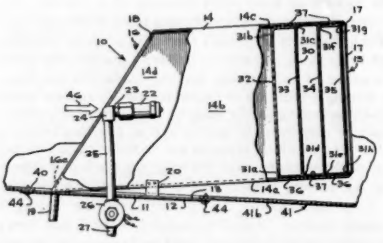
said axis and substantially conforming to the periphery of said paddle wheel; and

means constructed and arranged to raise said paddle wheel from a position in a channel to a height above said walls whereby to permit moving said carriage from one channel to another with said paddle wheel moving over said walls.

3,855,371
HUMIDIFYING APPARATUS FOR WARM AIR DUCTS AND THE LIKE

William B. Morrow, Winston-Salem, and Gary H. Anders, Rural Hall, both of N.C., assignors to Aqua Mist, Incorporated, Winston-Salem, N.C.

Filed Jan. 3, 1973, Ser. No. 320,818
Int. Cl. B01f *3/04*
U.S. Cl. 261—100 **13 Claims**

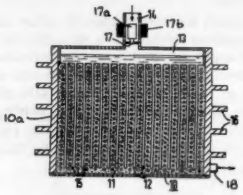


1. A humidifier assembly for use in association with a forced circulation warm air heating system including a horizontal heated air supply duct section communicating with a furnace and having a flat duct wall portion having an insertion opening formed therein, the humidifier assembly comprising a rigid planar mounting plate of a size to cover said insertion opening having edge portions to overlie the duct wall portions bounding said opening and be fastened thereto, an elongated tunnel duct member of four flat solid sheet metal tunnel walls of greater length than the dimension of the insertion opening along the direction of air flow in the duct section joined together along their longitudinal edges and defining an elongated humidifier tunnel of rectangular cross-section extending along a rectilinear tunnel axis inclined at a sharp angle to the plane of said mounting plate and having opposite open ends forming upstream and downstream end portions of the tunnel, means fixing said duct member to said mounting plate to locate the tunnel wholly within the duct section with a wall of the duct member supported against the mounting plate for flow of heated duct air therethrough with the downstream end portion located downstream beyond said opening when the mounting plate is positioned in covering relation to the opening, a spray discharge nozzle coupled through a valve to a water source and located within the tunnel adjacent its upstream end for discharging a mistlike spray pattern of water droplets in a downstream direction within the tunnel, and an evaporation screen supported within said tunnel downstream of said nozzle in the path of said water droplets to collect droplets thereon and evaporate them into the air flowing through the tunnel.

3,855,372
LIQUID VAPORIZER

Christian Koch, Erlangen, Germany, assignor to Sumens Aktiengesellschaft, Munich, Germany

Filed Mar. 15, 1973, Ser. No. 341,473
Claims priority, application Germany, Apr. 4, 1972, 2216196
Int. Cl. F02m *17/28*
U.S. Cl. 261—131 **12 Claims**



1. A liquid vaporizer comprising:

a. a porous body with a porosity in the range of 20 to 60 percent having essentially flat parallel front and rear sides and essentially flat parallel top and bottom sides;

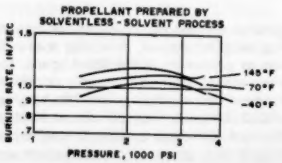
b. a plurality of evenly distributed spaced gas passages extending through said body from said front to said rear side; and

c. a plurality of spaced liquid passages extending from said top side to at least near said bottom side, essentially normal to said gas passages and arranged so that each gas passage has a liquid passage in close proximity thereto.

3,855,373
NEW PROCESS FOR MAKING NITROCELLULOSE BASE PROPELLANTS

Jacob M. Swotinsky, Morris Plains; Olindo A. Colitti, Parsippany, both of N.J., and James J. Confides, Chambersburg, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 290,286, Sept. 19, 1972, abandoned, which is a continuation of Ser. No. 80,611, Oct. 14, 1970, abandoned. This application Nov. 28, 1973, Ser. No. 419,828
Int. Cl. C06b *21/02*
U.S. Cl. 264—3 B **4 Claims**



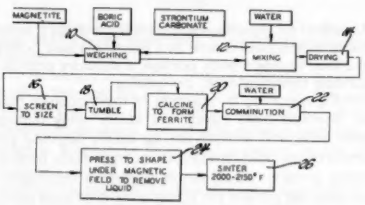
1. A process for preparing a propellant of high structural strength, which comprises:

a. preparing a colloided propellant composition by the solventless process comprising forming a slurry of nitrocellulose double base propellant ingredients in water, drying said aqueous slurry and subjecting the dried slurry to heated differential rolling to produce said colloided propellant composition;
b. contacting said colloided propellant composition with a liquid organic solvent consisting essentially of a mixture of one part by weight of acetone and between about one and six parts by weight of benzene, the amount of said solvent ranging from about 10 to 80 percent by weight of said propellant ingredients, until said propellant composition is essentially completely gelatinized;
c. mixing the gelatinized propellant composition until a mass of semi-dry, crumbly, extrudable particles is obtained;
d. extruding the particles to the desired shape; and
e. drying the extruded propellant to substantially remove the solvent, whereby a propellant of high structural strength is obtained.

3,855,374
METHOD OF MAKING MAGNETICALLY-ANISOTROPIC PERMANENT MAGNETS

Vladimir Brailowsky, Birmingham, and Erwin A. Alson, Fraser, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 51,751, July 2, 1970, abandoned. This application Dec. 22, 1972, Ser. No. 317,785
Int. Cl. C04b *35/26*
U.S. Cl. 264—24 **5 Claims**



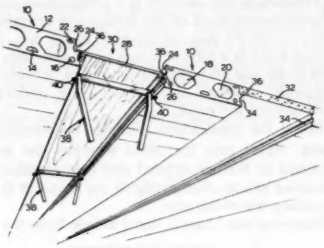
1. A method of making a permanent magnet of the hard ferrite type having a hexagonal crystalline lattice with a magnetoplumbite structure and a formula SrO. $6Fe_2O_3$, comprising the steps of mixing and milling magnetite with a source of SrO and about 0.3 to 1.5 percent, by weight, of a compound selected from the group consisting of boric acid and boric oxide to form a homogeneous mixture thereof, calcining said mixture, comminuting said calcined mixture to form particles thereof having an average size of about 1 to 2 microns, orienting and forming said particles into a body and sintering said body at a temperature in the range of 2000° to 2150° F.

3,855,375
FLOOR BUILDING SYSTEM

Joseph F. Boux, Burlington, Ontario, Canada, assignor to General Concrete of Canada Limited, Hamilton, Ontario, Canada

Filed Mar. 21, 1973, Ser. No. 343,551
Int. Cl. E04b *1/16*
U.S. Cl. 264—35 **4 Claims**

1. A method of constructing a floor which comprises positioning a plurality of prestressed concrete slabs having upper, lower and side faces in spaced apart locations, each of said slabs having a longitudinally-extending groove in each side face thereof adjacent the lower face thereof, each said groove defining with said lower face a shoulder, supporting each of said slabs in said spaced-apart locations at each end thereof, positioning at least one removable form between each pair of slabs and above said grooves to define therebetween a shallow elongated channel, for each said at least one form positioning at least two bracket supports in longitudinally spaced-apart positions beneath said form, each of said bracket supports having a beam member contacting said form and two arm members pivotally mounted to said beam member one adjacent each end therof, positioning the ends of said beam member in the opposed grooves of an adjacent pair of slabs, locking the ends of said beam member in said opposed grooves with said arm members depending generally downwardly from said beam member by moving flange elements on each of said arm members into engagement with said lower face of the

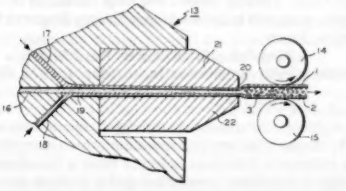


slabs cooperatively with the ends of the beam member to grip said shoulders thereby temporarily supporting each of said forms from below on an adjacent pair of slabs, pouring concrete into each of said channels at least to the depth thereof to define with the prestressed slabs a substantially flat floor surface, allowing the concrete to cure, moving said flange elements out of said engagement thereby releasing each of said bracket supports from said locked position, removing said ends of said beam members from said grooves, removing said beam members from engagement with said forms thereby releasing said temporary support, and separately removing said forms.

3,855,376
PROCESS FOR MAKING STRUCTURAL MATERIAL HAVING A FOAMED INNER LAYER

Kazuo Ono; Tadao Tsuchiya; Akio Kawamoto, all of Tokyo, Japan, and Jun Nakada, Tokorozawa, Japan, assignors to Mitsubishi Rayon Company Ltd. and Shin-Kobe Electric Machinery Company Limited, both of Tokyo, Japan

Division of Ser. No. 134,312, April 15, 1971,. This application Dec. 8, 1972, Ser. No. 313,261
Claims priority, application Japan, Apr. 24, 1971, 46-39407
Int. Cl. B29d *27/00;* **B29f** *3/00*
U.S. Cl. 264—46.1 **10 Claims**



7. The product of the process of claim **1.**

3,855,377

METHOD FOR IMPROVING INTERNAL FOAM FUSION OF MOLDED STYRENE POLYMER FOAM BILLETS

James J. Uebelhart, Beaver, and John P. Spicuzza, Jr., Pittsburgh, both of Pa., assignors to Arco Polymers, Inc., Glenolden, Pa.

Filed Oct. 24, 1972, Ser. No. 300,293
Int. Cl. B29d 7/00
U.S. Cl. 264—51 10 Claims

1. A method of forming a shaped foamed styrene polymer article from partially expanded styrene polymer particles capable of further expansion comprising:

a. filling a cold mold that defines the shape of the article with partially expanded styrene polymer particles;

b. presteaming the particles to a temperature just below the fusion temperature of the particles by introducing a mixture of 20–50 psig. steam and 30–60 psig. air into the filled mold in a ratio of steam to air pressures of between 20 to 60 and 50 to 40, for a time of between 15 and 40 seconds. whereby the particles are uniformly heated throughout the mold;

c. fusing the presteamed particles by introducing 20–50 psig. steam into the mold whereby the particles are caused to further expand and fuse together to form a foamed article conforming to the shape of the mold;

d. cooling the mold; and

e. removing said shaped, fused article from the mold.

3,855,378

PROCESS FOR PREPARING CELLULAR RUBBER

Barry Topcik, Somerville, N.J., assignor to Cities Service Company, Tulsa, Okla.

Filed June 28, 1973, Ser. No. 374,717
Int. Cl. B29h 7/20
U.S. Cl. 264—54 5 Claims

1. In a process for preparing a cellular rubber by heating a composition comprising (A) a vulcanizable rubber selected from the group consisting of butyl rubber, chlorinated butyl rubber, brominated butyl rubber, ethylene-propylene copolymer, ethylene-propylene-diene terpolymer, chlorosulfonated polyethylene, natural rubber, synthetic polyisoprene, polybutadiene, butadiene-styrene copolymer, butadiene-acrylonitrile copolymer, polychloroprene, polyacrylate, polyepichlorohydrin, epichlorohydrin-ethylene oxide copolymer, and mixtures thereof, (B) a vulcanizing agent, and (C) a blowing agent to cure and expand the rubber, the improvement which comprises initiating cure of the rubber by heating the composition under a pressure of about 1,000–2,000 psi in a mold at a temperature within the range of about 220°–400°F. which is lower than that at which substantial decomposition of the blowing agent occurs, removing the partially cured rubber composition from the mold, and completing cure of the rubber at a higher temperature within the range of about 300°–420°F. which permits substantial decomposition of the blowing agent and expansion of the composition.

3,855,379

NOVEL POLYBUTADIENE DERIVATIVE CURABLE WITH IONIZING RADIATION

Kunio Araki; Takashi Sasaki, and Keiji Nishio, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Feb. 29, 1972, Ser. No. 230,486
Claims priority, application Japan, Mar. 4, 1971, 46-10964
Int. Cl. C08g 22/00
U.S. Cl. 260—77.5 CR 8 Claims

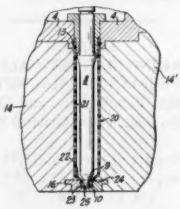
1. A process for preparing a polybutadiene derivative curable by means of an ionizing radiation, which comprises reacting a polymeric butadiene selected from a butadiene homopolymer, a butadiene copolymer and a mixture thereof, said polymeric butadiene having a number-average molecular weight ofabout 200–100,000 and containing a functional group having an active hydrogen and not less than about 30 percent of the butadiene units in said polymeric butadiene being 1,2-bond, with an isocyanate compound having an unsubstituted or substituted vinyl group, in the proportion of said isocyanate compound providing not less than about 0.5 equivalent of the isocyanate group per said polymeric butadiene providing 1 equivalent of the active hydrogen.

3,855,380

METHOD FOR MANUFACTURING UNITARY, SEAMLESS, COLLAPSIBLE THERMOPLASTIC TUBES

James O. Gordon, Wheeling, Ohio; Bruce T. Cleevely, Pittsburgh, Pa., and William B. Niemi, East Longmeadow, Mass., assignors to Wheeling Stamping Co., Wheeling, W. Va.

Continuation of Ser. No. 151,281, June 9, 1971, abandoned. This application Nov. 6, 1973, Ser. No. 413,194
Int. Cl. B29c 17/07, 17/10
U.S. Cl. 264—97 12 Claims



1. A method for injection-blow molding a unitary, seamless, collapsible thermoplastic tube of a predetermined configuration, the tube having a body portion, a shoulder portion, and an externally threaded neck, comprising:

a. forming a parison by injection of thermoplastic material into an injection mold cavity, the cavity being defined by separable mold wall sections and an axially disposed parison pin therebetween, said parison pin having a body portion and a shoulder portion, which shoulder portion terminates as a narrow neck, the parison pin terminating in a flared portion at the end opposite the narrow neck portion, said flared portion arranged within a sealing ring whereby a groove is formed, with thermoplastic material filling said groove to form a rib around the parison, during forming of said parison;

b. transferirng the parison pin with the resultant parison to a blow-mold cavity, the confines of the blow-mold cavity corresponding to the predetermined configuration of the tube and having a threaded neck portion therein;

c. injecting fluid through the parison pin to expand the parison to the confines of the mold to shape the parison to the predetermined configuration and form a threded neck on the tube, while said parison is retained on the parison pin adjacent said flared portion thereof by retention of the rib thereon within said grooves; and

d. ejecting the expanded and shaped tube having the desired configuration from the blow-mold cavity.

3,855,381

METHOD OF MAKING PLASTIC CARTRIDGE CASING

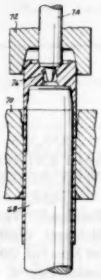
George R. Eckstein, Fairfield, and William G. Moyher, Stratford, both of Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Division of Ser. No. 199,913, Nov. 18, 1971, Pat. No. 3,786,755. This application June 28, 1973, Ser. No. 374,336
Int. Cl. B29c 27/30
U.S. Cl. 264—138 6 Claims

1. A method of making a cartridge casing comprising the following steps:

1. Forming a slug of thermoplastic material having a tubular, thick-walled construction;

2. Expanding the slug radially to increase the inner and outer diameters of the tubular slug and to flare one of the ends of the slug outwardly;
3. Positioning the non-flared end of said radially expanded slug into the bore of an extrustion die and impacting said slug so as to form a highly oriented tube having an externally flanged end portion;
4. Trimming the plastic tube at the end opposite to the externally flanged end portion;
5. Forming the flanged end portion of the slug to change the profile thereof and prepare the section for proper finished dimensions and profile control, said profile changes comprising decreasing the outer diameter to a predetermined dimension in order to permit it to be inserted into the die for the following step, repositioning and thickening the externally flanged portion so that the flange is on the inside of the tube and defining a central opening which is of predetermined diameter for the next step, said plastic



slug at this point resembling a roughly formed cartridge casing;
6. Pre-heading the roughly formed cartridge casing by inserting the flanged slug into a die and compressing the flanged end into approximate final dimensions and including an extruded, continuous, annular lip means which extends rearwardly from the periphery of the central opening;
7. Pushing the shell mouth first through a sizing die in order to decrease the outer diameter of the shell and to correct irregularities in the processing;
8. Washing the plastic casings in hot fluid at the desired temperature to relax the stresses in the casing and to stabilize the dimensions at or below that temperature;
9. Inserting the pre-headed casing into a metallic cup means and heading the casing to final dimensions including the forcing of said annular extruded lip into the primer opening to form an oriented, continuous, gas sealing ring integral with the inside of the final primer opening.

3,855,382

PROCESS FOR PRODUCING FLAME-RETARDANT ACRYLIC FIBERS

Kenji Takeya, Okayama; Toshiyuki Kobashi, and Kenichi Masuhara, both of Okayama-ken, all of Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Mar. 13, 1973, Ser. No. 340,888

Claims priority, application Japan, Mar. 21, 1972, 47-28295

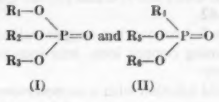
Int. Cl. D01f *3/10*

U.S. Cl. 264—210 F **10 Claims**

1. An improved process for producing flame-retardant acrylic fibers which comprises

a. preparing acrylic fibers in a hydrogel condition by wet-spinning a spinning solution, which consists of acrylonitrile homo- or co-polymers and a concentrated aqueous solution of thiocyanate, containing finely dispersed particles of a halogen-containing polymer selected from the group of homo- and co-polymers of vinyl halide and homo- and co-polymers of vinylidene halide,

b. treating said acrylic fibers in a hydrogel condition with at least one organic compound, which can dissolve, swell or plasticize the halogen-containing polymer, selected from the group of an organic phosphate and an organic phosphonate respectively represented by the following general formulas (I) and (II)



(I) (II)

wherein R_1, R_2, R_3, R_4, R_5 and R_6 each are alkyl group having one to 20 carbon atoms, haloalkyl group having one to 20 carbon atoms, alkenyl group having one to 20 carbon atoms, arylalkyl group having seven to 20 carbon atoms, alkylaryl group having seven to 20 carbon atoms, or aryl group and may be the same with or different from each other and R_4 may be hydrogen atom or

wherein R is alkylene group having one to six carbon atoms or haloalkylene group having one to six carbon atoms, and R_7 and R_8 each are a same group as R_1 to R_6, and

c. thereafter stretching at least three times its initial length in hot water above 90°C.

3,855,383

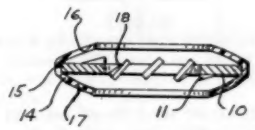
SEALING LOCK WASHER AND METHOD OF MANUFACTURING

John Victor Stanley Dahlgren, c/o Essdee Products, 98 Ocean Blvd., Atlantic Highlands, N.J. 07716

Filed Apr. 24, 1972, Ser. No. 246,568

Int. Cl. B21d *53/22*; **B29c** *13/00*; **F16b** *39/24*

U.S. Cl. 264—230 **3 Claims**



1. The method of making a self-sealing radial tooth lock washer, which comprises

a. supplying a radial tooth lock washer having teeth thereon being twisted to extend beyond opposed axial end faces of the washer,

b. positioning over said washer in generally concentric relation thereto a tubular section of heat-shrinkable elastomeric material,

c. positioning said tubular section with its axial ends projecting substantially axially beyond the principal surfaces of said washer formed by its axial end faces, and.

d. subjecting said washer to heat thereby constricting the tubular section by effecting radial shrinkage thereof, whereby portions of said tubular section intermediate its ends are brought into tightly constricted radially compressing relation to the outer peripheral edges of the washer,

e. and constricting the radially shrunk tubular section end portions during the heating, thereby causing said end portions to overly in juxtaposition the opposed axial faces of the washer.

3,855,384
PROCESS FOR WINNING COPPER USING CARBON MONOXIDE

Michael Dubeck, Birmingham, and Suk Joong Im, Southfield, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed June 28, 1972, Ser. No. 267,241
Int. Cl. C01g *3/00*; **C22b** *15/12*; **C01g** *1/04*
U.S. Cl. 423—42 **6 Claims**

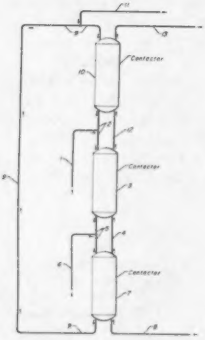
1. A process for recovering copper values from an acidic solution containing copper ions, iron ions and chloride ions which comprises

1. treating said solution with a carbon monoxide containing gas at elevated temperatures of from about 80° to about 300°C. and pressures of from about 10 psia to about 5,000 psia for a time sufficient to form a copper containing complex as a precipitate, and
2. separating said precipitated complex from said solution, whereby copper values substantially free from iron are obtained.

3,855,385
RECOVERY OF RHENIUM FROM A SPENT CATALYST

Armand J. Derosset, Clarendon Hills, and Kenneth A. Morgan, Hoffman Estates, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 12, 1973, Ser. No. 415,063
Int. Cl. C01g *47/00*, *39/00*
U.S. Cl. 423—49 **7 Claims**



1. A process for the recovery of rhenium from a molybdenum-containing alum solution resulting from the digestion of a spent platinum-rhenium-alumina catalyst in concentrated sulfuric acid, with a platinum-containing residue having been separated by filtration which comprises

a. charging said alum solution downwardly through a first contactor column in contact with an amine solution charged upwardly therethrough at conditions to maintain an amine/rhenium mole ratio of from about 1.4 to about 1.8 in the lower portion of said column and extracting substantially all of the rhenium contained in said alum solution;
b. charging the resulting rhenium-containing amine solution upwardly through a second contactor column in contact with an alum solution charged downwardly therethrough and containing sufficient added rhenium to maintain an amine/rhenium mole ratio in the upper portion of said column of from about 0.1 to about 1.2, and stripping substantially all of the molybdenum from said rhenium-containing amine solution, and extracting a major portion of the rhenium contained in said alum solution;
c. charging the resulting molybdenum-containing alum solution downwardly through the first contactor column in admixture with the first mentioned alum solution charged thereto, and separating and recovering the molybdenum-free rhenium-containing amine solution;
d. discharging a portion of the molybdenum-containing alum solution passing downwardly through said first contactor column, and charging the remaining portion downwardly through a third contactor column in contact with an amine solution charged upwardly therethrough, extracting substantially all of the molybdenum contained in said alum solution, and charging the resulting alum solution and added rhenium downwardly through said second contactor column in accordance with step (a), and charging the resulting amine solution upwardly through the second contact column in accordance with step (a).

3,855,386
CATALYTIC FUSED SALT EXTRACTION PROCESS FOR REMOVAL OF SULFUR OXIDES FROM FLUE OR OTHER GASES

Raymond H. Moore, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Continuation-in-part of Ser. No. 201,275, Nov. 23, 1971, abandoned. This application Dec. 4, 1972, Ser. No. 311,471
Int. Cl. B01d *47/00*; **B01j** *9/04*; **C01b** *17/00*
U.S. Cl. 423—210.5 **7 Claims**

1. A process for removing sulfur dioxide from a gaseous stream, comprising the steps of:

contacting the gaseous stream with a molten liquid homogeneous catalyst extraction salt mixture at a temperature between 400° C. and 500° C. having (1) a dissolved oxygen compound of vanadium to catalytically oxidize the sulfur dioxide to sulfur trioxide and (2) a dissolved potassium normal sulfate to solvate the sulfur trioxide to extract the sulfur trioxide from the gaseous stream and form a sulfur dioxide depleted gaseous stream and a sulfur trioxide loaded molten liquid salt mixture;

separating the sulfur trioxide loaded molten liquid salt mixture and the sulfur dioxide depleted gaseous stream before the molten salt mixture becomes saturated with sulfur trioxide; and

electrolytically disassociating the separated sulfur trioxide loaded molten liquid salt mixture to produce a gaseous effluent of sulfur trioxide and to regenerate at least a portion of the potassium normal sulfate.

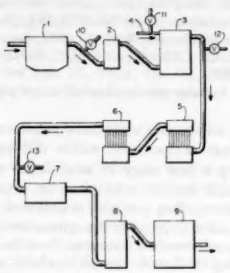
3,855,387
METHOD FOR REMOVING MERCURY FROM INDUSTRIAL GASES

Charles Anthony Brockmiller; Robert E. Lund, and John Edward Fitzsimmons, all of Monaca, Pa., assignors to St. Joe Minerals Corporation, New York, N.Y.

Filed Sept. 5, 1973, Ser. No. 394,514
Int. Cl. B01d *53/34*
U.S. Cl. 423—210 **4 Claims**

1. The method of removing mercury from sulfur dioxide containing industrial gas preparatory to catalytic oxidation of

the sulfur dioxide which comprises admixing hydrogen sulfide with the gas and thereafter subjecting the gas to a suspended



solids removal operation prior to the catalytic oxidation of the sulfur dioxide.

3,855,388

METHOD OF PREPARING AN OXIDATION CATALYST FOR PARTIALLY COMBUSTED GASES

Edward J. Rosinski, Deptford, N.J., assignor to Mobil Oil Company, New York, N.Y.

Filed Jan. 11, 1971, Ser. No. 105,743
Int. Cl. B01j *11/22*
U.S. Cl. 423—213.2 **5 Claims**

1. A method of preparing a catalyst containing from about 10 to 30 percent by weight copper chromite, this method comprising intimately admixing in the solid state (1) a support comprising primarily alumina at least 20 percent of which is in the hydrated state and (2) a source of copper chromite, said copper chromite being of the formula CuO/Cr_2O_3 wherein the molar ratio of CuO to Cr_2O_3 is from 0.3–3:1, said source of copper chromite being selected from the group consisting of copper chromite and a mixture of a coppercontaining compound and a chromium-containing compound, which mixture on calcination yields copper chromite, said coppercontaining compound being selected from the group consisting of CuO, $Cu_2(OH)_2O$, $Cu(OH)_2$, and mixtures thereof, and said chromium-containing compound being selected from the group consisting of Cr_2O_3, $cr_2(oh)_3$, $Cr_2(OH)_2O$, $Cr(OH)O$, $(NH_3)_2Cr_2O_7$, $(NH_4)CrO_4$, and mixtures thereof, the proportions of said support and said source of copper chromite being such as to provide from 10 to 30 percent by weight of copper chromite in the final dried catalyst, shaping the resulting product, drying said product to remove substantially all of the water therefrom and calcining said product.

3,855,389

METHOD OF TREATING EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Richard L. Klimisch, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 26, 1972, Ser. No. 318,680
Int. Cl. B01d *53/34*
U.S. Cl. 423—213.5 **3 Claims**

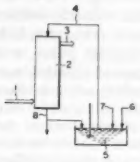
1. A method for catalytically reducing nitrogen oxides contained in internal combustion engine exhaust gases while minimizing the formation of residual ammonia comprising, passing said exhaust gases at temperatures above about 650° C into contact with a catalyst consisting essentially of alumina having a surface area from 10 to 300 square meters per gram containing, by weight, about 5 to 25 percent nickel and a small, but catalytically effective amount up to about 1 percent of palladium.

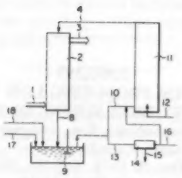
3,855,390

PROCESS FOR PURIFYING A GAS CONTAINING HYDROGEN CYANIDE

Mituaki Matumoto, and Tadayoshi Aono, both of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Oct. 13, 1972, Ser. No. 297,264
Claims priority, application Japan, Oct. 18, 1971, 46-82233
Int. Cl. C01b *3/04, 3/20;* **C02b** *1/28;* **C01f** *11/46*
U.S. Cl. 423—236 **5 Claims**





1. A method for reducing the COD level of an aqueous solution containing thiocyanate comprising oxidizing the thiocyanate present by mixing the solution with a gas containing free oxygen such that there are more than two moles of free oxygen present for each mole of thiocyanate in the solution and heating the mixture at a temperature of at least 150°C and a pressure sufficient to maintain the reaction mixture in the liquid phase.

3,855,391

SLUDGE STABILIZATION WITH GYPSUM

Joseph G. Selmeczi, Pittsburgh, and Daniel W. Kestner, Coraopolis, both of Pa., assignors to Dravo Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1973, Ser. No. 326,020
Int. Cl. C01b *17/60;* **C04b** *11/02*
U.S. Cl. 423—242 **4 Claims**

1. Method of disposing of wastes from a sulfur-fuel burning power plant utilizing a sulfur dioxide scrubber which generates finely divided calcium-sulfur compound containing waste products which are disposed in an aqueous sludge which is collected for disposal, the method comprising:

a. incorporating 0.1–1000 parts per million of finely divided oxidizing catalyst selected from the group comprising manganese, ferric, nickel, cobalt and copper oxides, and sulfate, nitrate and chloride salts of nickel, cobalt and copper, in the scrubbing liquor, which catalyst is selected to ensure that a high percentage of calcium sulfate is formed in the scrubber;
b. separating a portion of between 1–20 percent of the discharged calcium sulfate containing sludge from the remainder, drying said portion and treating the dried calcium sulfate at from 260°–360°F for a time sufficient to convert the calcium sulfate to plaster of paris;
c. admixing the plaster of paris with the remainder of the generated sludge, and
d. dewatering and curing the admixed sludge to stabilize the solids therein as a landfill material.

3,855,392

METHOD OF REMOVING BORIC ACID AND BORIC ACID SALTS FROM AQUEOUS MAGNESIUM CHLORIDE SOLUTIONS

Finn Enok Folkestad, Heistad, Norway; Kjell Olav Loiten; Glor Thorvald Mejdell, and Asbjorn Torvund, all of Porsgrunn, Norway, assignors to Norsk Hydro a.s., Oslo, Norway

Filed Sept. 24, 1971, Ser. No. 183,683

Claims priority, application Norway, Sept. 29, 1970, 3686/70

Int. Cl. C01b *35/00;* B01d *11/04*

U.S. Cl. 423—497 7 Claims

1. A method of removing boric acid and salts thereof from an aqueous magnesium chloride solution by liquid-liquid extraction using an organic extractant, followed by re-extraction of boron from the organic phase, consisting essentially of employing as extractant at least one univalent aliphatic alcohol having 7 to 12 carbon atoms in the molecule diluted with petrol ether in the ratio of 1 part by volume of alcohol in 1 to 20 parts by volume of petrol ether, the extraction being effected at a pH not above 7, while the subsequent re-extraction of boron from the organic phase is effected at a pH not below 7.

3,855,393

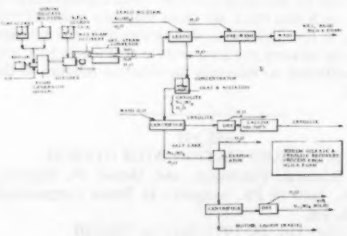
PROCESS FOR PRODUCING LOW THERMAL CONDUCTIVITY HIGH STRENGTH SILICA FOAM

Ramesh P. Rao, San Antonio, Tex., assignor to Fiberglas Canada Limited, Ontario, Canada

Filed Dec. 9, 1971, Ser. No. 206,438

Int. Cl. C01b *33/12*

U.S. Cl. 423—339 4 Claims



1. In a process for the preparation of inorganic silica foam wherein an aqueous alkali metal silicate chosen from sodium and potassium silicates is foamed and said foam is cured in the presence of an alkali metal or alkaline earth metal silicofluoride insolubilizer, resulting in a rigid foamed structure having cell walls formed of silica, and containing interstitial alkali metal fluoride reaction product, and treating said cured foam for the removal of alkali metal fluoride, the improvement which comprises preventing degradation and weakening of the strength and insulation properties of the foamed mass by carrying out said leaching step prior to the occurrence of substantial damaging crystal growth of alkali metal fluoride in the wet foamed mass, and by leaching the cured, wet foam with an aqueous solution or colloidal aqueous suspension of an acid or acidic salt leaching agent, said leaching agent being non-reactive with respect to silica, said leaching agent having the ability to form water soluble or water dispersible fluoride compounds or complexes having reduced affinity for the silica structure.

3,855,394

SILICA PIGMENTS AND PREPARATION THEREOF

Oliver W. Burke, Jr., P.O. Box 2266, Fort Lauderdale, Fla. 33061

Division of Ser. No. 864,954, Oct. 3, 1968, Pat. No. 3,719,741, which is a continuation of Ser. No. 698,358, Jan. 16, 1968, abandoned. This application Nov. 16, 1972, Ser. No. 307,083

Int. Cl. C01b *33/12, 33/17, 33/18*

U.S. Cl. 423—339 7 Claims

1. A process for the production of silica pigment which comprises

a. maintaining an aqueous solution of alkali metal silicate at a first average temperature within the liquid range of water during a first stage of acidulation while feeding carbon dioxide into the solution in an amount sufficient to form primary silica particles in colloidal suspension in the solution and to provide the appearance of a Tyndall effect in the solution, the time span from the commencing of the feeding of carbon dioxide until the appearance of the Tyndall effect being 30 to 300 minutes

b. maintaining the composition produced by step (a) at a second, higher average temperature within the liquid range of water during a second stage of acidulation while continuing the feeding of carbon dioxide into the composition, said second stage of acidulation beginning with the appearance of the Tyndall effect and ending when sufficient carbon dioxide has been fed to effect precipitation as pigment of about 10 percent of the silica content of the composition, said second average temperature being at least 10° C. higher than said first average temperature, and the duration of said second stage being about 30 to 300 minutes,

c. continuing the precipitation of the silica by continuing the feeding of carbon dioxide into the composition produced by step (b) until at least 90 percent of the silica has precipitated as pigment, while maintaining the temperature of the composition within the liquid range of water,

d. continuing the feeding of carbon dioxide into the composition produced by step (c) until at least enough thereof has been fed to convert substantially all of the Na_2O content of the composition to Na_2CO_3, and

e. recovering the precipitated silica pigment from the mother liquor.

3,855,395

PRODUCTION OF SILICON NITRIDE FROM RICE HULLS

Ivan B. Cutler, Penn, England, assignor to University of Utah, Salt Lake City, Utah

Filed Sept. 6, 1972, Ser. No. 286,641The portion of the term of this patent subsequent to Aug. 21, 1990, has been disclaimed.

Int. Cl. C01b *21/06;* B01j *17/00*

U.S. Cl. 423—344 4 Claims

1. A method for producing silicon nitride from rice hulls, comprising the steps of:

placing rice hulls within an enclosure having an oxygen free atmosphere;

heating the rice hulls to a temperature within the range on the order of about 1100°C to 1350°C; and simultaneously exposing the heated rice hulls to gaseous nitrogen until the silicon in the rice hulls is changed to silicon nitride; and

separating the silicon nitride.

3,855,396
METHOD OF CONTINUOUSLY PRODUCING COBALT CARBONYL HYDRIDE

Wilhelm Kniese, Limburgerhof; Juergen Plueckhan, Beindersheim; Rudolf Kummer, Frankenthal; Hans Juergen Nienburg, Ludwigshafen, and Peter Tavs, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda Fabrik Aktiengesellschaft, Rhienland, Pfalz, Germany

Filed Jan. 24, 1972, Ser. No. 220,442

Claims priority, application Germany, Jan. 26, 1971, 2103454

Int. Cl. C01g 1/04, 51/02

U.S. Cl. 423—417 6 Claims

1. In an improved process for the continuous production of cobalt carbonyl hydride by treatment of an aqueous solution of a cobalt salt selected from the group consisting of cobalt sulfate, cobalt chloride, cobalt nitrate, and a lower fatty acid salt of cobalt with an excess of carbon monoxide and hydrogen at a temperature of from 50° to 200°C and a pressure of from 50 to 500 atmospheres gauge in the presence of cobalt carbonyl, wherein the improvement comprises carrying out the treatment in the presence of an activated carbon, a zeolite or a basic ion exchanger which has been loaded with cobalt carbonyl, and maintaining during the treatment a loading of 0.5 to 50 grams of cobalt in the form of one of said cobalt salts per hour per kilogram of said activated carbon, said zeolite, or said basic ion exchanger.

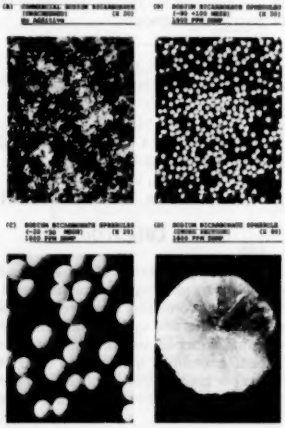
3,855,397
METHOD OF PRODUCING SODIUM CARBONATE AND BICARBONATE SPHERULES FROM BRINE

Robert J. Hoffman, Liverpool, and Alan G. Follows, Camillus, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 12, 1973, Ser. No. 350,453

Int. Cl. C01d 7/10, 7/40, 7/12

U.S. Cl. 423—422 8 Claims



1. A process for making sodium bicarbonate in the form of crystalline spherules from a solution containing between about 15 to 25 percent of sodium salt selected from the group consisting of sodium chloride and sodium carbonate, which comprises adding from 200 to 2500 parts per million by weight of the solution of a water-soluble alkaline phosphorus-containing compound selected from the group consisting of alkali metal and alkaline earth metal phosphate, hypophosphates, phosphites, hypophosphites and phosphides, and carbonating the solution under condition to effect conversion of the sodium salt to sodium bicarbonate, and recovering the sodium bicarbonate substantially in the form of crystalline spherules.

3,855,398
SODIUM CARBONATE AND BICARBONATE SPERULITES FROM CHLORINE ELECTROLYTIC CELL LIQUORS

Robert J. Hoffman, Liverpool, and Alan G. Follows, Camillus, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 12, 1973, Ser. No. 350,454

Int. Cl. C01d 7/100, 7/12, 7/40

U.S. Cl. 423—422 7 Claims

1. A process for producing sodium bicarbonate in the form of crystalline spherules from a sodium hydroxide/sodium chloride solution comprising:

a. carbonating the solution under conditions sufficient to form sodium carbonate;

b. introducing 200 to 2,500 parts per million (ppm) by weight of a water-soluble alkaline phosphorus-containing compound selected from the group consisting of alkali metal and alkaline earth metal phosphates, hypophosphates, phosphites, hypophosphites and phosphides;

c. continuing the carbonation of the solution until substantially all of the sodium carbonate present in the solution has been converted to sodium bicarbonate; and

d. recovering the resulting sodium bicarbonate from the carbonated solution.

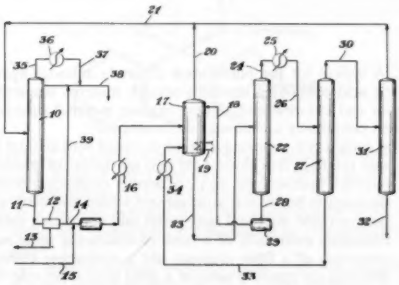
3,855,399
PROCESS OF PRODUCING HYDROGEN FLUORIDE FROM FLUOSILICIC ACID

A. Theodorus van Elji, Terneuzen, Netherlands, assignor to Dow Chemical (Nederland) B.V., Terneuzen, Netherlands

Filed Aug. 16, 1973, Ser. No. 389,100

Int. Cl. C01b 7/22

U.S. Cl. 423—483 7 Claims



1. A method of preparing hydrofluoric acid from fluosilicic acid comprising

a. commingling in an absorber at least one glycol of the group consisting of ethylene glycol, propylene glycol or diethylene glycol with aqueous fluosilicic acid or a mixture of aqueous fluosilicic acid and a minor quantity of aqueous hydrofluoric acid while maintaining a temperature of from about 120° to about 130°C. at the top of the absorber, and from about 175° to about 190°C. in the bottom portion, thereby disproportionating the fluosilicic acid into silicon tetrafluoride and hydrofluoric acid,

b. removing an overhead stream containing substantially all of the silicon tetrafluoride and some water from the top of the absorber,

c. feeding the silicon tetrafluoride and water to a reactor and thereby convert the silicon tetrafluoride to aqueous fluosilicic acid and silicon dioxide, and recycling the fluosilicic acid to step a,

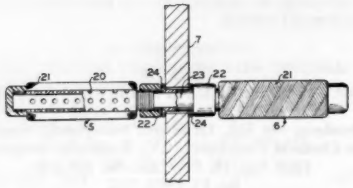
d. passing the glycol enriched with aqueous hydrofluoric acid from step a into a distillation column,

e. distilling substantially all of the hydrofluoric acid from the glycol,
f. recycling the glycol to the absorber of step a,
g. converting the hydrofluoric acid of step e into aqueous and anhydrous fractions and returning the aqueous fraction of step g to the absorber of step a.

3,855,400
PURIFICATION OF HYDROCHLORIC ACID

Roberto Paolieri, Youngstown; Todd A. Pitts, Snyder, and James W. McCloskey, Buffalo, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Feb. 10, 1972, Ser. No. 225,221
Int. Cl. B01j *9/04*
U.S. Cl. 423—488 **14 Claims**



1. A system for the purification of crude aqueous hydrochloric acid containing insoluble organic material suspended therein and chlorine and soluble organic material dissolved therein comprising a coalescer and a stripper:

said coalescer comprising a vessel provided with an inlet for said crude hydrochloric acid and an outlet for partially purified hydrochloric acid, a porous coalescing means disposed in horizontal arrangement within said coalescer between said inlet and said outlet said coalescing means consisting essentially of a bank of coalescing units each consisting of a filter element and a coalescing element attached on opposite sides of a solid tube sheet said elements being of substantially identical design and comprising a perforated pipe section the perforations of which being covered with a porous winding of acid resistant material, said coalescing means being disposed so as to form two separate compartments within said coalescer whereby all the liquid introduced into the coalescer passes through the coalescing means before exiting from the coalescer, a discharge port disposed in the coalescer in the lower portion thereof at a point downstream from said coalescing means for discharge of coalesced organic material;

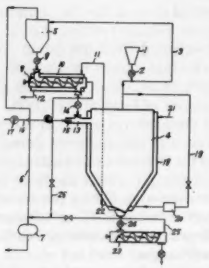
said stripper comprising a vertical column having an inlet for partially purified hydrochloric acid in the upper portion thereof and an outlet in the lower portion thereof for discharging purified hydrochloric acid, an inlet in the lower portion of the stripper for admitting inert gas and an outlet in the upper portion of the stripper for exiting inert gas containing desorbed chlorine and soluble organic material;

and means for conveying partially purified hydrochloric acid from the outlet of the coalescer to the inlet in the upper portion of the stripper.

3,855,401
PROCESS FOR MANUFACTURING ALUMINUM FLUORIDE

Hiroshi Aiso, Kawanishi; Takumi Takemura, and Toshinobu Takeuchi, both of Osaka, all of Japan, assignors to Daikin Kogyo Kabushiki Kaisha, Osaki-shi, Japan

Filed Dec. 20, 1971, Ser. No. 209,731
Claims priority, application Japan, Dec. 23, 1970, 45-128265
Int. Cl. C01f *7/50*
U.S. Cl. 423—489 **8 Claims**



1. A process for manufacturing aluminum fluoride, which comprises contacting at 300° to 550°C particulate alumina hydrate with hydrogen fluoride to produce aluminum fluoride by continuously introducing particulate alumina hydrate preheated to a temperature of from 250° to 450°C into a reaction zone and continuously spraying at least stoichiometric amounts of hydrogen fluoride in the liquid state or hydrofluoric acid having a concentration of more than **80** percent by weight onto the particulate alumina hydrate continuously fed and separating the resulting aluminum fluoride in the form of particles from gaseous substances.

3,855,402
PROCESS FOR PRODUCTION OF TRIBASIC LEAD SULPHATE MONOHYDRATE

Geoffrey Charles Bratt, West Moonah, Tasmania, Australia, assignor to Electrolytic Zinc Company of Australasia Limited, Melbourne, Victoria, Australia

Filed Oct. 8, 1971, Ser. No. 187,809
Claims priority, application Australia, Oct. 12, 1970, 2824/70
Int. Cl. C01g *21/20*
U.S. Cl. 423—559 **3 Claims**

1. A process for the production of tribasic lead sulphate monohydrate comprising reacting lead sulphate with a reagent selected from the group consisting of aqueous ammonia, mixtures of aqueous ammonia and solid ammonium sulphate, and solutions containing aqueous ammonia and ammonium sulphate, the reagent containing a minimum of 0.24 ml 35% aqueous ammonia per gram of lead sulphate, and the temperature of the reaction being maintained between ambient and 200°C, with agitation.

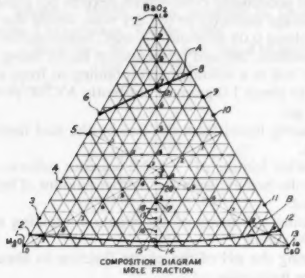
3,855,403
OXYGEN ENRICHMENT PROCESS

Jack Huebler, Deerfield, Ill.; Lester G. Massey, Moreland Hills, Ohio, and Paul B. Tarman, Elmhurst, Ill., assignors to Consolidated Natural Gas Service Co., Cleveland, Ohio

Division of Ser. No. 242,153, April 7, 1972, Pat. No. 3,773,680. This application July 30, 1973, Ser. No. 383,815
Int. Cl. C01b *13/08, 15/04*
U.S. Cl. 423—579 **21 Claims**

1. In a method of producing oxygen by alternately contacting air with an oxygen acceptor composition and thereafter

stripping said oxygen from said composition, under conditions effecting reversible acceptance and removal of oxygen therefrom.

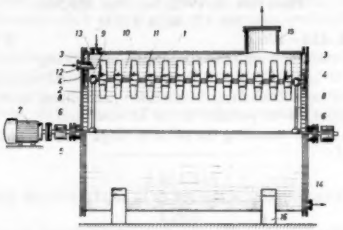


the improvement which comprises using as said acceptor composition a mixture of BaO_2, MgO, and CaO in which the mole ratio of CO_2 to BaO_2 is less than 1.0, and the mole percentages of CaO, BaO_2 and MgO lie between the curves A and B in FIG. 1.

3,855,404
PROCESS AND APPARATUS FOR THE CONTACTING OF TWO OR MORE PHASES

Cornel-Constantin N. Rotaru, Savinesti-Piatra Neamt, Romania, assignor to Centrala Industriala De Fibre Chimice, Savinesti, Romania

Filed Sept. 15, 1972, Ser. No. 289,223
Claims priority, application Romania, Sept. 24, 1971, 68277
Int. Cl. B01f *3/04, 7/14;* **B01j** *1/00*
U.S. Cl. 423—659 **6 Claims**



1. An apparatus for the continuous contacting of at least two different reaction phases comprising:
- a housing having a generally horizontal axis;
- at least one inlet for reactants opening into said housing;
- at least one outlet for products leading from said housing;
- a central axial shaft rotable in said housing;
- at least one planetary agitator in said housing, said agitator comprising:
- a planetary gear within said housing,
- a planetary shaft within said housing operatively connected to said gear, and
- a plurality of axially spaced radially projecting blades mounted on said planetary shaft and orbiting short of said central shaft;
- a pair of generally radial arms fixed to said central shaft and projecting therefrom;
- means for journaling said planetary shaft on the free ends of said arms and radially spaced from said central shaft;
- a gear fixed in said housing meshing with said planetary gear for rotating said planetary shaft upon orbital motion of the planetary gear; and
- means for rotating relatively said housing and said central shaft to cause said planetary shaft to rotate about its axis and simultaneously to orbit said central shaft.

3,855,405
RADIOGRAPHIC CONTRAST COMPOSITION CONTAINING 2',6'-DIIODO-DL-THYRONINE AND METHODS OF USE THEREOF

Glenn D. Dobben, South Holland, Ill., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,406
Int. Cl. A61k *27/08*
U.S. Cl. 424—5 **8 Claims**

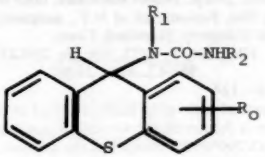
1. An encephalomyelographic, bronchographic or lymphangiographic composition for radiography comprising about 200 to 500 mg./ml. of **2',6'-diiodo-dl-thyronine in a sterile physiologically acceptable vehicle for injection or instillation.**

3,855,406
THIAXANTHENE DERIVATIVES

Stuart Sanders Adams; Bernard John Armitage; Norman William Bristow, and Bernard Vincent Heathcote, all of Nottingham, England, assignors to The Boots Company, Limited, Nottingham, England

Division of Ser. No. 191,111, Oct. 20, 1971, Pat. No. 3,754,005, which is a continuation-in-part of Ser. No. 662,587, Aug. 23, 1967, Pat. No. 3,644,420. This application Apr. 19, 1973, Ser. No. 352,504
Int. Cl. A61k *27/00*
U.S. Cl. 424—35 **13 Claims**

1. A therapeutic composition useful for treating peptic ulcers which comprises an effective anti-secretory amount of a thiaxanthen compound of the formula



in which R_o is a member selected from the group consisting of hydrogen, halogen, alkyl containing up to 7 carbon atoms and alkoxy containing up to 7 carbon atoms;

R_1 is a member selected from the group consisting of hydroxy and alkanoyloxy containing up to 7 carbon atoms; and

R_2 is a member selected from the group consisting of hydrogen and alkyl containing up to 7 carbon atoms;

in association with a pharmaceutically acceptable excipient.

3,855,407
METHOD OF PROTECTING THE SKIN WITH 5-(3,3-DIMETHYL-2-NORBORNYLIDENE)-3-PENTENE-2-ONE

Erich Klein, Holzminden, Germany, assignor to Dragoco Spezialfabrik konz, Riech- und Aromastoffe Gerberding & Co. GmbH, Holzminden, Germany

Continuation-in-part of Ser. No. 791,781, Jan. 16, 1969, abandoned. This application Jan. 11, 1972, Ser. No. 216,923
Claims priority, application Austria, Aug. 8, 1968, 7757/68
Int. Cl. A61k *9/06;* **A61l** *23/00*
U.S. Cl. 424—59 **2 Claims**

1. A method of protecting the human skin against the action of erythema-producing irradiation, said method comprising applying to the human skin an effective amount of a preparation comprising a cosmetically acceptable carrier and from about 0.005 to 5.0% of 5-(3,3-dimethyl-2-norbornylidene)-3-pentene-2-one incorporated in said carrier.

3,855,408

POULTRY VACCINE

S. K. Maheswaran, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed July 16, 1973, Ser. No. 379,356
Int. Cl. A61k *23/00*
U.S. Cl. 424—92 4 Claims

1. A method for prophlactic treatment of fowl cholera which comprises administering to poultry a vaccine comprising a small but effective amount of live stable avirulent antibacterial encapsulated *Pasteurella multocida* mutant strain M–2283.

3,855,409

METHOD FOR TREATING HYPERCHOLESTEROLEMIA

Harry W. Gordon, Bronz, N.Y., and Carl P. Schaffner, Trenton, N.J., assignors to Schmid Laboratories, Inc., Little Falls, N.J.

Division of Ser. No. 24,797, April 1, 1970, abandoned, which is a continuation of Ser. No. 627313, March 31, 1967, Pat. No. 3,627,879. This application Sept. 2, 1971, Ser. No. 177,512
Int. Cl. A61l *21/00*
U.S. Cl. 424—121 3 Claims

1. A process for treating hypercholesterolemia in a large mammal afflicted with hypercholesterolemia which comprises orally administering an effective dose for treating hypercholesterolemia of filipin to said mammal.

3,855,410

METHOD FOR THE PRODUCTION AND ISOLATION OF ANTIBIOTIC AV290 SULFATE

Murray Dann; Joseph Daniel Korshalla, both of Pearl River, and Ping Shu, Pomona, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed May 4, 1972, Ser. No. 250,222
Int. Cl. A61k *21/00*
U.S. Cl. 424—124 4 Claims

1. A process of recovering highly purified antibiotic AV290 sulfate from a fermentation whole harvest mash containing antibiotic AV290 which comprises the steps of:

a. producing a fermentation liquor by clarifying the whole harvest mash,
b. adjusting the pH of the fermentation liquor to about 6 with sulfuric acid,
c. feeding the fermentation liquor to a bed of carboxymethyl substituted cross-linked dextran gel grains having an average diameter in the dry state within the range of from about 0.05 to about 0.5 mm., immersed in an aqueous medium, the said fermentation liquor being supplied to the bed in a volume corresponding to from about 0.1 gram to about 1.0 gram of antibiotic AV290 per gram of a dry gel,
d. displacing liquid from the bed by the said fermentation liquor,
e. thereafter feeding pH 1.4–2.0 aqueous sulfuric acid eluant to the bed to displace a further amount of liquid from the bed,
f. collecting a fraction of the eluate containing antibiotic AV290 sulfate,
g. adjusting the pH of the eluate fraction to about 6 with barium hydroxide,
h. removing the precipitated barium sulfate,
i. adsorbing the antibiotic activity onto granular activated carbon from the clarified eluate fraction,
j. eluting the antibiotic activity from the granular activated carbon with acetone:water (2:3) solution, and
k. isolating antibiotic AV290 sulfate from the acetone:water eluate;

steps (a) through (j) being carried out at a temperature of from about 15° C. to about 30° C.

3,855,411

METHOD OF STABILIZATION OF 6-(1-AMINOCYCLOHEXANECARBOXAMIDO) PENICILLANIC ACID AND RESULTANT COMPOSITIONS

Surendra M. Bahal, Audubon, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 3, 1972, Ser. No. 303,562
Int. Cl. A61k *21/00*
U.S. Cl. 424—176 3 Claims

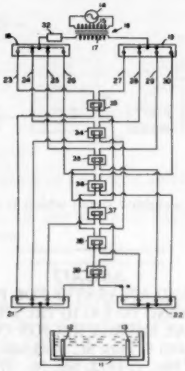
1. A stabilized aqueous suspension comprising:

A. At least 2.5 to 10 percent w/v of anhydrous 6-(1-aminocyclohexanecarboxamido) penicillanic acid;
B. about 70–86 percent w/v of sucrose; and
C. A buffer adjusting the pH to a range between about 4 to 6.5.

3,855,412
CURRENT EQUALIZATION MEANS AND METHOD FOR UNEQUALLY LOADED CABLES IN AN ELECTRIC GLASS MELTING FURNACE

John F. Maddux, Heath, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 29, 1973, Ser. No. 410,865
Int. Cl. C03b *5/02*
U.S. Cl. 13—6 **13 Claims**



1. An electric furnace for resistive heating of a molten material having a negative temperature coefficient of resistance, comprising:

a chamber for containing said material;

a pair of electrodes immersed in said material;

a source of alternating current;

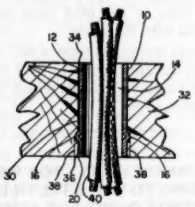
current carrying means comprising plural paths connected between each of said pair of electrodes and said source; and

magnetic coupling means for inductive coupling of a magnetic field generated by each current path of said current carrying means in opposition to at least one other magnetic field generated by another current path of said current carrying means.

3,855,413
WIRE PROTECTOR FOR MOBILE HOMES AND THE LIKE

William R. Baillie, Hoffman Estates, Ill., assignor to Blue Ribbon Industries, Inc., Arlington Heights, Ill.

Filed Mar. 15, 1973, Ser. No. 341,476
Int. Cl. H02g *3/04*
U.S. Cl. 174—48 **4 Claims**



1. An electrical wire protecting installation in a mobile home or the like including:

A. a wooden structural member forming a support for a partition or the like and through which electrically conductive wires are adapted to be passed,

B. a cylindrical passageway in the structural member passing fully through the same, the walls defining said passageway consisting of the raw wood of said structural member and

C. a metal wire protector tightly wedged in said passageway and comprising:

i. a hollow right cylindrical tubular body member formed of rolled sheet steel and

ii. having a closed axially extending seam formed at abutting ends of the sheet member from which the body is formed,

iii. the outer diameter of the body member being the same as the inner diameter of the passageway and the axial length of the body member being substantially the same as the axial length of the passageway,

iv. the axial ends of the body member being open,

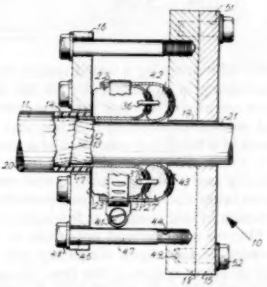
v. and there being a plurality of circumferentially spaced generally spherical upset protrusions formed on the exterior of the body member,

the wire protector adapted to be installed by driving the same into the passageway so that the protrusions dig into the wooden walls defining the passageway to wedge the protector in place without substantial tearing of fibers and provide a protected metal passageway for electric wires through the structural member.

3,855,414
CABLE ARMOR CLAMP

Leon L. Alleva, and Ralph G. D'Ascoli, both of Yonkers, N.Y., assignors to The Anaconda Company, New York, N.Y.

Filed Apr. 24, 1973, Ser. No. 354,063
Int. Cl. H02g *15/08*
U.S. Cl. 174—89 **6 Claims**



1. Apparatus for securing inner and outer overlying layers of cable armor wires to a bulkhead, comprising:

A. a first heavy metal plate having a passageway for said cable, said cable being covered by said layers of armor wires,

B. a second heavy metal plate having a passageway for said cable absent said armor wires, said second plate having a concave area surrounding said passageway,

C. a first heavy metal ring fitting around the outer layer of said armor wires, said ring being positioned between said first and said second plates and having a flat surface facing toward said first plate and a convex surface facing away from said first plate and toward said second plate,

D. a second heavy metal ring positioned between said first and said second plates fitting around the inner layer of said armor wires, said second ring being concentric to and

axially displaced from said first ring, said second ring having a concave surface matchingly facing toward said convex surface of said first ring and also having a convex surface facing away from said first ring matching said concave area of said second plate,

E. means clampingly urging together said first and said second plates, thereby securing said armor wires of said outer layer between said convex surface of said first ring and said concave surface of said second ring, said armor wires of said outer layer being folded radially around said first ring, and securing said armor wires of said inner layer between said convex surface of said second ring and said concave area of said second plate, said armor wires of said inner layer being folded radially around said second ring, and

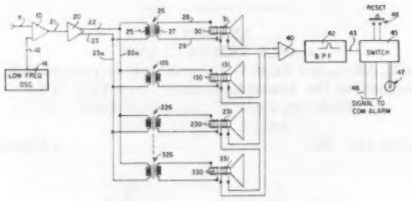
F. means for securing said second plate to said bulkhead.

3,855,415

COMMUNICATION SOUND SYSTEM CONTINUOUSLY MONITORED

Robert C. Fox, Batavia; James S. Altman, Hinsdale, and Charles W. King, St. Charles, all of Ill., assignors to Du Kane Corp., St. Charles, Ill.

Filed July 20, 1973, Ser. No. 380,995
Int. Cl. H04r *29/00*
U.S. Cl. 179—1 MN **5 Claims**



4. A method of monitoring a sound system communication channel terminating in a loudspeaker of the dynamic type having a voice coil axially movable within an annular magnetic air gap, said method comprising injecting into said channel signal currents at a fixed frequency and at a low energy level compared to sound currents at different frequencies in said channel, feeding said signal currents to said speaker to produce air waves below audibility, deriving potentials incident to voice coil motion in said speaker at frequencies of voice coil vibrations, filtering said derived potentials to suppress frequencies outside of said signal frequency and feeding such potentials to an alarm system of the type whose condition is responsive to the presence or absence of signal frequency potentials.

3,855,416

METHOD AND APPARATUS FOR PHONATION ANALYSIS LEADING TO VALID TRUTH/LIE DECISIONS BY FUNDAMENTAL SPEECH-ENERGY WEIGHTED VIBRATTO COMPONENT ASSESSMENT

Fred H. Fuller, 4450 S. Park St., Chevy Chase, Md. 20014

Filed Dec. 1, 1972, Ser. No. 311,422
Int. Cl. G10l *1/04*
U.S. Cl. 179—1 SA **14 Claims**

1. A method for detecting emotional stress in the utterance of an individual comprising:

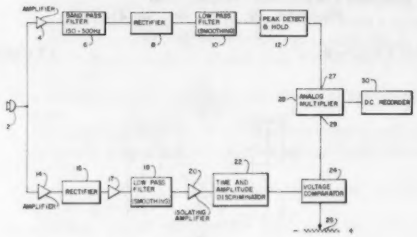
converting said utterance to an electrical signal;

selecting a frequency band of said electrical signals;

detecting the peak amplitude of said selected frequency band;

simultaneously with said frequency selecting and peak detecting, smoothing said electrical signals to form an envelope, detecting rapid aperiodic amplitude modulation on said envelope, and selecting detected modulation exceeding a preselected amplitude;

weighting said selected modulating with said detected peak amplitude; and



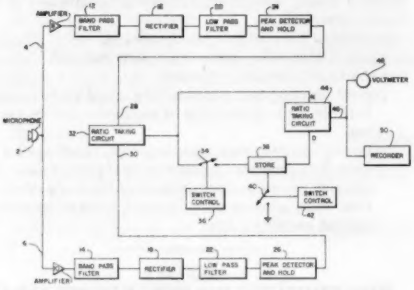
displaying said weighted signal which is indicative of emotional stress.

3,855,417

METHOD AND APPARATUS FOR PHONATION ANALYSIS LENDING TO VALID TRUTH/LIE DECISIONS BY SPECTRAL ENERGY REGION COMPARISON

Fred H. Fuller, 4450 S. Park St., Rockville, Md. 20014

Filed Dec. 1, 1972, Ser. No. 311,391
Int. Cl. G10l *1/04*
U.S. Cl. 179—1 SA **9 Claims**



1. A method for detecting emotional stress in the utterance of an individual comprising:

converting said utterance to an electrical signal;

selecting two different frequency bands of said electrical signal;

detecting and holding the peak amplitude of each frequency band for the duration of the utterance;

computing the ratio of the held peak amplitude of one frequency band with the other;

storing a previously computed ratio of said peak amplitudes;

comparing subsequent ratios with said stored ratios; and

displaying the compared results which would be indicative of emotional stress.

3,855,418

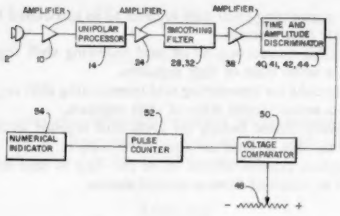
METHOD AND APPARATUS FOR PHONATION ANALYSIS LEADING TO VALID TRUTH/LIE DECISIONS BY VIBRATTO COMPONENT ASSESSMENT

Fred H. Fuller, 4450 S. Park St., Chevy Chase, Md. 20014

Filed Dec. 1, 1972, Ser. No. 311,392
Int. Cl. G10l *1/04*
U.S. Cl. 179—1 SA **13 Claims**

1. A method to detect emotional stress in the speech of an individual comprising:

converting said speech to an electrical signal;
smoothing said electrical signal to produce an envelope;
isolating any rapid aperiodic amplitude modulations present on said smoothed envelope;



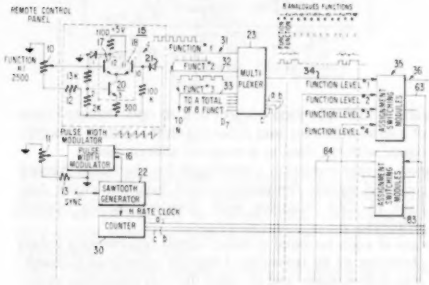
counting the number of said rapid aperiodic modulations; and
indicating the count per utterance which is indicative of emotional stress.

3,855,419

PWN MULTIPLEX SYSTEM

Winslow Leroy Hurford, Cape Coral, Fla., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 206,487, Dec. 9, 1971, abandoned. This application Aug. 22, 1973, Ser. No. 390,433
Int. Cl. H04j *7/00*
U.S. Cl. 179—15 AW **6 Claims**



1. Apparatus for transmitting a plurality of individual information signals related to the status of a number of control function devices located at a first location and each indicative of a predetermined level necessary to perform a desired control function at a location remote from said first, by multiplexing said information signal levels and transmitting the same via a common linkage between said first location and said remote location, comprising:

a. multiplexing means at said first location, having a plurality of input terminals and a single output terminal coupled to said common linkage, each of said input terminals being coupled to separate ones of said control function devices and responsive to said information signal levels for providing a single series of pulses at said output terminal, with the width of each pulse of said series being indicative of the status of individual ones of said control function devices such that each control function to be performed is represented by the position and width of a single pulse in said series, and with said series of pulses having a given periodicity,

b. demultiplexing means at said remote location, having a single input terminal coupled to said common linkage and a plurality of output terminals, said demultiplexing means being responsive to individual pulses within said single series of pulses at its input terminal to generate a plurality of pulse series, one for each output terminal, with the width of each pulse in individual ones of said plurality of series corresponding to the width of that pulse in said single series which generated it to indicate only the status of that one of said control devices governing the function to be performed and with each of said plurality of pulse series having a periodicity less than said given periodicity by a factor equal to the number of said control function devices,

c. a plurality of pulse stretching means, each having an input and an output terminal, with said input terminal being coupled solely to one separate output terminal of said demultiplexing means, for providing at the output terminal of each stretching means one of said plurality of pulse series at an increased periodicity up to but not exceeding that provided by said multiplexing means, and

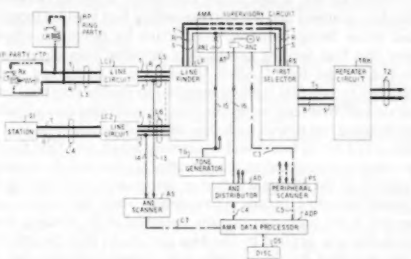
d. means coupled to the output terminals of said pulse stretching means for generating control signals from said plurality of pulse series which correspond in level to said information signals indicative of the status of each control function device at said first location.

3,855,420

SUPERVISORY CIRCUIT

Robert Elling Steidl, Columbus, Ohio, assignor to Bell Laboratories Incorporated, Murray Hill, N.J.

Filed Mar. 26, 1973, Ser. No. 344,995
Int. Cl. H04q *3/18*
U.S. Cl. 179—17 A **10 Claims**



3. In a telephone system wherein a calling station is identified as active by current flow in one direction through a signaling loop comprising two transmission conductors which are connected together at said calling station while said calling station remains active and wherein a called station is identified as active by current flow in the opposite direction through said signaling loop,

a supervisory circuit for connection in said loop comprising

first sensing means connected in one of said conductors for detecting current flow through said loop only in said one direction,

second sensing means connected in the other of said conductors for detecting current flow through said loop only in said opposite direction, and

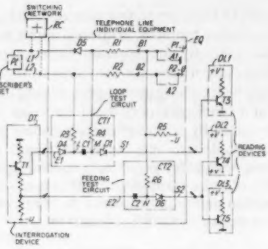
logic means responsive to said first and second sensing means in combination for indicating

1. an active calling station when only said first sensing means detects current flow,
2. a call destination signal when neither said first and second sensing means detects current flow, and
3. an active called station when only said second sensing means detects current flow.

3,855,421
TELEPHONE SUBSCRIBER LINE CIRCUIT

Harold William Cliff Pilling, Madrid, Spain, and Gerard Marcel Le Cardonnel, Neuilly sur-Seine (Hauts-de-Seine), France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 26, 1972, Ser. No. 220,987
Int. Cl. H04m *3/22*
U.S. Cl. 179—18 FA **4 Claims**



1. Telephone line individual equipment for use in a telephone exchange comprising first and second line terminals, a feeding potential source, a feeding circuit including first and second feeding terminals coupled to the respective line terminals, switching means provided to connect the feeding potential source to the feeding terminals to supply potentials to the individual equipment when it is not connected through an exchange, a loop test circuit coupled to detect and signal whether a line coupled to the first and second line terminals is looped or not, a first diode connected in series between a first line terminal and the corresponding first feeding terminal, said diode being rendered conductive by potential supplied over the first feeding terminal, a resistive bias circuit connected to the first feeding terminal, a feeding test circuit coupled to said first feeding terminal to enable potential existing on said first feeding terminal to be evaluated and signalled, the feeding test circuit including means determinative that the line is fed by its individual equipment when said first feeding terminal is connected to the potential source and the potential existing on the terminal is that of this source, said feeding test circuit including means determining when the line is connected in the exchange that the potential of the feeding terminal is the one applied by the bias circuit, so that the information provided by the feeding test circuit indicates the line condition and enables the information provided by the loop test circuit to be interpreted to identify the particular condition of the line.

3,855,422
TIME DIVISION MULTIPLEXER WITH EACH FRAME CONSISTING OF A FIXED LENGTH BIT ORIENTED ADDRESS FIELD AND A VARIABLE LENGTH CHARACTER ORIENTED DATA FIELD

Jean Jacques Cadiou, Vence; Georges Rene Guerinet, La Colles/Loup, and Paul Raymond Callens, Cagnes/Mer, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 5, 1973, Ser. No. 376,783
Claims priority, application France, July 10, 1972, 72.25775
Int. Cl. H04j *3/08*
U.S. Cl. 179—15 AL **3 Claims**

1. A multiplexing device for controlling the transmission of data characters between a central station and selectively chosen ones of a plurality of terminal stations wherein:

the data characters are multiplexed into frames containing not more than one character for each terminal station with each frame consisting of a frame identifying character, an address character identifying the terminal stations for which frame data characters are present in the frame and a variable number of data characters, said device including;

a receiving and a transmitting shift register for each terminal,

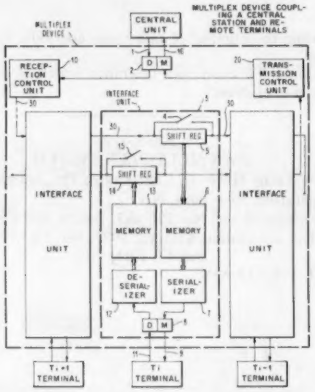
means connecting each shift register to its associated terminal for data transfer,

circuits for connecting all of said receiving shift registers into a serial train of shift registers,

other circuits for connecting said transmitting shift registers into a second serial train of shift registers,

a normally closed switch for each shift register to bypass said circuits around the associated register,

a reception control unit to store the data in said address field as received from a central station,



means in said reception control unit to open selected ones of said switches for said receiving shift registers in accordance with the data in a received address field,

means in said reception control unit for thereafter passing received signals representing said variable length data field to said receiving shift registers having opened switches,

means at each terminal to store signals representing a data character to be transmitted into its associated transmitting shift register and to open the corresponding switch for said shift register, and

a transmission control unit activated by storage of a data character in one or more of said transmission shift registers to control transmission to said central unit of a frame of data including the characters stored in said transmitting shift registers having opened switches.

3,855,423
NOISE SPECTRUM EQUALIZER

Henry Tzvi Brendzel, Parsippany, Morris County, and Richard Allan Smith, Mount Olive Twp., Morris County, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

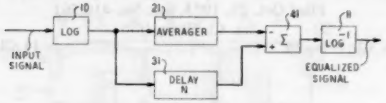
Filed May 3, 1973, Ser. No. 356,918
Int. Cl. H04b *1/66*
U.S. Cl. 179—15.55 R **16 Claims**

1. The method of equalizing applied power spectrum samples representative of functions containing periodic signals embedded in noise comprising the steps of:

preconditioning each of said applied power spectrum samples to reduce the effects of strong periodic signals;

obtaining a neighborhood-mean equalizing signal associated with each of said applied power spectrum samples by forming an amplitude average of a predetermined num-

ber of said preconditioned spectrum samples in the vicinity of said preconditioned power spectrum samples; and equalizing each of said applied power spectrum samples



by arithmetically combining each of said preconditioned power spectrum samples with each of said associated neighborhood-mean equalizing signals.

3,855,424

INFORMATION PROCESSOR FOR CHANGING TEMPO OF PLAYBACK FROM THE RECORDED TEMPO

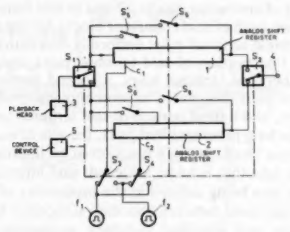
Poothathamby Tharmaratnam, Mollenhutsfweg, and Johannes Meijer Cluwen, Emmasingel, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 30, 1973, Ser. No. 328,019

Claims priority, application Netherlands, Feb. 15, 1972, 72/1920

Int. Cl. H04b *1/66*; **G11b** *15/20*

U.S. Cl. 179—15.55 T **8 Claims**



1. A circuit arrangement for playing back recorded information in a tempo which differs from the original recording tempo, and particularly for playing back retarded or accelerated speech while maintaining the correct pitch, said circuit arrangement comprising:

a first shift register having an input, an output, and an auxiliary output;

a second shift register having an input, an output, and an auxiliary output;

means for supplying information in a desired tempo to said registers;

a first electronic switch disposed between said registers and said information supplying means to alternately apply said information to said registers;

a second electronic switch operated in phase opposition to said first switch, said second electronic switch connected to said registers for alternatively deriving an output signal therefrom;

means for supplying said registers with clock pulses for advancing information therethrough;

first switching means disposed between said registers and said clock pulse supplying means, for alternately, but in phase opposition, applying said clock pulses to said registers, frequencies of said clock pulses jumping from one value to another at each change-over of said switching means, a ratio of these frequencies being equal to a speed ratio between the speed at which said information is applied to the shift registers and the speed at which said information is recorded; and

second switching means connected to respective registers, for connecting the respective auxiliary output of each register to the input of said respective register, said respective auxiliary outputs being partway along said registers between said inputs and said outputs such that said information at said auxiliary output is less advanced in said register than that corresponding to said respective output signal.

3,855,425

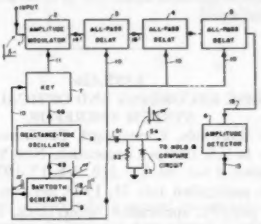
DELAY LINE TIME COMPRESSOR AND EXPANDER

Bernhard E. Keiser, 2046 Carrhill Rd., Vienna, Va. 22180

Continuation-in-part of Ser. No. 191,010, Oct. 20, 1971, abandoned. This application June 14, 1973, Ser. No. 369,810

Int. Cl. H04b *1/66*

U.S. Cl. 179—15.55 T **6 Claims**



1. A delay line time expander and a delay line time compressor for compressing an information signal into a narrow bandwidth, and subsequently expanding it to the original bandwidth, comprising:

a delay line time expander which requires only a time expansion means and which consists of:

a first amplitude modulator for impressing said information signal on a first carrier signal to produce a first amplitude modulated signal;

a first series of identical all-pass delay networks, having a predetermined phase versus frequency characteristic, responsive to the first amplitude modulated signal produced by said first amplitude modulator;

a first key for gating said first carrier signal to said first amplitude modulator;

a first sawtooth-controlled reactance-tube oscillator for producing said first carrier signal and for sweeping, with a first sawtooth waveform, the frequency of said first carrier signal, said first carrier signal then being sent through said first key at all times, except during said first sawtooth waveform's flyback, to said first amplitude modulator and thence to said first series of all-pass delay networks to impart a first variable time delay to said first amplitude modulated signal as obtained at the output of said first series of all-pass delay networks;

a first amplitude detector responsive to said first series of all-pass delay networks to produce a time expanded information signal; and,

a delay line time compressor which requires only a time compression means and a cycle repetition means, said delay line time compressor consisting of:

a second amplitude modulator for impressing said time-expanded information signal on a second carrier signal to produce a second amplitude modulated signal;

a second series of identical all-pass delay networks constructed with the same phase vs. frequency characteristics as said first series, and responsive to the second amplitude modulated signal produced by said second amplitude modulator;

a second key for gating said second carrier signal to said second amplitude modulator;

a second sawtooth-controlled reactance-tube oscillator for producing said second carrier signal and for sweeping with a second sawtooth waveform, whose repetition rate is the same as that of said first sawtooth waveform, the

frequency of said second carrier signal, said second carrier signal then being sent through said second key at all times, except during said second sawtooth waveform's flyback, to said second amplitude modulator and thence to said second series of identical all-pass delay networks to impart a second variable time delay to said second amplitude-modulated signal as obtained at the output of said second series of all-pass delay networks, said second variable time delay being maximum when said first variable time delay is minimum, and vice versa;

a second amplitude detector responsive to said second series of all-pass delay networks to produce a time-compressed signal; and,

a cycle repetition means connected to the output of said delayline time compressor providing an output in which each portion of the signal from said second amplitude detector is repeated a plurality of times to reconstruct the original signal.

3,855,426

VIDEO DISC RECORDING AND OPTICAL PLAYBACK SYSTEM THEREFOR

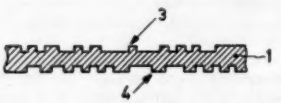
Gijsbertus Bouwhuis, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 227,210, Feb. 17, 1972, abandoned. This application July 25, 1973, Ser. No. 382,482

Claims priority, application Netherlands, Mar. 11, 1971, 7103233

Int. Cl. H04n *5/76*; **G11b** *7/24*, *23/18*

U.S. Cl. 179—100.3 V **4 Claims**



1. An information carrier comprising a transparent disc-shaped carrier, a first planar spiral shaped information track in said carrier, a second planar spiral shaped information track in said carrier parallel to said first track, said first spiral track decreasing in distance from the center of the carrier in one rotational direction viewed from one side of said carrier, said second spiral track increasing in distance from the center of the carrier in said one rotational direction viewed from one side of said carrier, information signal successively recorded along said first information track from the outer portion of said first information track to the inner portion thereof, information signals successively recorded along said second information track from the inner portion of said second information track toward the outer portion thereof, said information being recorded in each track in the form of a plurality of spaced areas of optically transparent material, all of the areas of each track having a coplanar surface, the coplanar surface of said first track being spaced from the coplanar areas of said second track and parallel thereto, all the material in the disc between the coplanar surface of each area in each information track and the next following information track in the disc being optically transparent, whereby a converging beam of radiation from one side of the disc passes through the coplanar surfaces of the information tracks and may be focussed on said first track until all the information recorded thereon is scanned, and then immediately refocussed through said first track, scanning the information of said second track maintaining the rotational direction of said carrier without the necessity of turning said carrier over or displacing said beam rapidly to the outer portion of said second track.

3,855,427

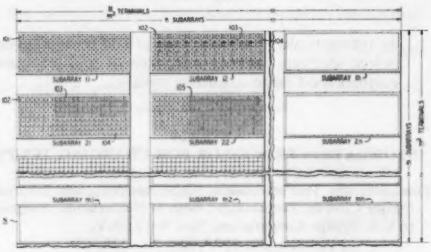
MAIN DISTRIBUTION FRAME INTERCONNECTION WIRING TECHNIQUE AND APPARATUS

Frank William Sinden, Summit, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1973, Ser. No. 410,561

Int. Cl. H04q *1/06*

U.S. Cl. 179—98 **11 Claims**



8. A main distribution frame used for effecting cross connections between subscriber line cables and switching equipment cables with jumper cables comprising

a frame support structure,

a plurality of connector blocks affixed to said frame support structure, each of said connector blocks having a plurality of electrical terminal pairs uniformly distributed thereon with a first portion of said terminal pairs designated as subscriber line terminal pairs, a second portion of said terminal pairs designated as switching equipment terminal pairs, and a third portion of said terminal pairs designated as long jump terminal pairs, the size of each of said connector blocks being a function of an interconnection success rate that is to be achieved, said interconnection success rate being defined as the probability of completing connections between specified subscriber line terminal pairs and specified switching equipment terminal pairs with a single cross connecting jumper cable,

means for terminating said subscriber line cables and said switching equipment cables on said subscriber line terminal pairs and said switching equipment terminal pairs, respectively, on said connector blocks, and

means for terminating said cross connecting jumper cables on said subscriber line terminal pairs and said switching equipment terminal pairs.

3,855,428

SPEAKER DIAPHRAGM

Tadasi Itagaki, Tokorozawa, Japan, assignor to Pioneer Electric Corporation, Tokyo and Tokorozawa Electronics Corporation, Tokorozawa-shi, Saitana, Japan

Filed Oct. 30, 1972, Ser. No. 301,930

Claims priority, application Japan, Oct. 29, 1971, 46-100611

Int. Cl. H04r *7/14*, *7/16*, *9/06*

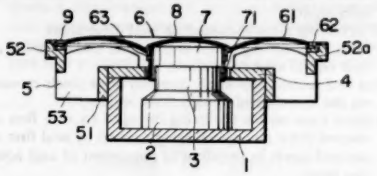
U.S. Cl. 179—115.5 ES **2 Claims**

1. In a loudspeaker having an annular thin film diaphragm, an annular frame concentrically surrounding an axially movable voice coil, said diaphragm including an annular portion with its inner peripheral edge supporting a rearwardly directed cylindrical bobbin holding said voice coil and its outer peripheral edge fixed to said frame, the improvement wherein:

said frame includes an annular, right angle recess within the forward end face of the same at its inner periphery,

said diaphragm includes a right angle, U-shaped annular indentation inwardly of its outer peripheral edge at a radial position corresponding to said frame recess, said indentation forming a reinforcing rib,

and a right angle flange portion radially outward thereof, the radially outer sidewall of said indentation is fixed to the radially inner sidewall of said frame recess, and



the right angle flange portion of said outer peripheral edge of said diaphragm, radially outwards of said radially outer sidewall, is fixed to the forward end face of said frame with the forward surface of said diaphragm free of said frame.

3,855,429

LOUDSPEAKER FIXTURE

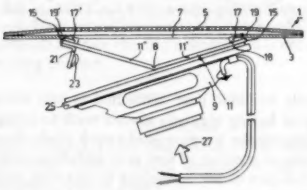
Gunter Krainhofer, Solms, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 6, 1973, Ser. No. 348,685

Claims priority, application Germany, June 19, 1972, 2229679

Int. Cl. H04r *1/02*

U.S. Cl. 179—146 R **10 Claims**



1. A loudspeaker fixture for mounting a loudspeaker to the rear of a loudspeaker baffle by means of a clamping plate which engages with the fixing flange of the loudspeaker and which does not obstruct the loudspeaker aperture, characterized in that the clamping plate consists of two parts which can be pivoted relative to each other, and one of which is secured to the loudspeaker chassis, and that insertion hooks have been provided near those edges of the clamping plate parts which face away from the hinge, by means of which hooks said edges can be attached to the edges of the loudspeaker aperture, and that the axial distance between the hooks is slightly smaller than the distance between the associated clamping plate edges and the edges of the loudspeaker aperture respectively, so that when the bent clamping plate is depressed into the plane of the loudspeaker baffle the entire plate is compressed axially between the hooks, thus securing the loudspeaker.

3,855,430

ELECTRONIC HYBRID CIRCUIT FOR TWO-WIRE TO FOUR-WIRE INTERCONNECTION

Joel Serge Colardelle, Cretell; Pierre Girard, Paris, and Paul Henri Lerouge, Maurepas, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

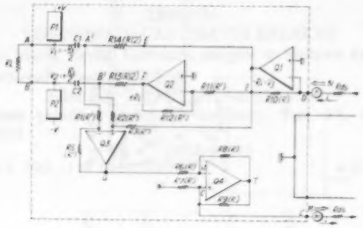
Filed Nov. 15, 1972, Ser. No. 306,595

Claims priority, application France, Nov. 19, 1971, 71.41460

Int. Cl. H04b *1/58*

U.S. Cl. 179—170 NC **8 Claims**

1. An electronic two-wire to four-wire conversion circuit comprising a pair of input terminals connected to a balanced subscriber's line which provides a first variable voltage for data transmission in a first direction and which receives a second variable voltage for data transmission in the reverse direction, a receive terminal pair connected via first transmission means to said input terminals to transmit data signals toward the reverse direction, said first transmission means including first and second operational amplifiers connected to the receive terminal pair and to each other to convert unbalanced data signals applied to the receive terminal pair into balanced signals appearing across the input terminals, a transmit terminal pair connected via second transmission means to said input terminals to transmit data signals toward the first direction, said second transmission means including a differential amplifier connected across the pair of input terminals and connected in series with a current generator having an output connected to the transmit terminal pair, said second transmission means converting balanced input signals into unbalanced signals, and third means coupled between the output of the first operational amplifier and the non-inverting input of the differential amplifier for preventing signal reflections from the reverse direction to the first direction.



3,855,431

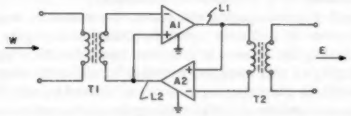
ELECTRONIC HYBRID AMPLIFIER

Alan Stewart, Elk Grove Village, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 2, 1973, Ser. No. 347,160

Int. Cl. H04b *3/36*; **H04m** *9/08*

U.S. Cl. 179—170 NC **7 Claims**

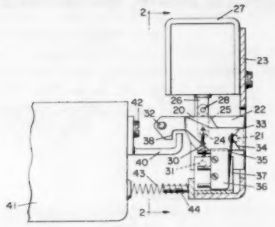


1. A two wire transmission system having individual legs across the output of a transformer coupled to a balanced load, wherein AC signals received across the input of the transformer are inverted relative to one another in the respective legs; the invention comprising a first and a second difference amplifier, each having two input terminals and an output terminal, means coupling one input terminal of said first amplifier to one output leg of said transformer to receive signals therefrom, means coupling the other input terminal of said first amplifier to the other output leg of said transformer to receive inverted signals therefrom whereby to algebraically subtract in said first amplifier signals received from said transformer, and said second difference amplifier in said second leg with its output terminal coupled to the other leg of said transformer; the input terminals of said second amplifier coupled to the output of said first amplifier to attenuate signals reflected from the output of said first amplifier.

3,855,432
DRAWER POSITION SENSING LATCH OPERATED SWITCH ASSEMBLY

James E. Kelly, Cambridge; Kenneth L. Shooter, Senecaville, and Ray L. Lawter, Zanesville, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 25, 1974, Ser. No. 445,194
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.61 12 Claims



1. In combination with an enclosure structure including a slidably mounted drawer having an engaging member secured thereto, a latch apparatus for generating a signal upon latching of the drawer in a closed position within the enclosure structure comprising:

a. latching means movably secured to said enclosure structure and positioned in the plane of movement of the drawer engaging member, said latching means being moved to an operating position, by the engaging member upon movement of the drawer in a drawer closing direction, conditioning the engaging member to be latched by said latching means when the engaging member is moved in a drawer open direction;

b. signal generating means mounted on said enclosure structure for generating a signal when operated, said signal generating means includes an actuating member for operating said signal generating means when actuated;

c. actuating means operably associated with said latching means and engageable with said actuating member, said actuating means includes a latching portion for engaging the engaging member upon movement of the drawer in a drawer closing direction, said actuating means actuating said actuating member when moved by said engaging member in a drawer open direction;

d. and means engaging the drawer for normally urging the drawer in a drawer open direction, said urging means moving the drawer in a drawer open direction upon engaging of said engaging member by said actuating means whereby the engaging member is latched by said latching means and the signal generating means is operated by said actuating member.

3,855,433
HIGH VOLTAGE SWITCH ARRANGEMENT

Joseph Bernatt, Arlington Heights, and Edward J. Rogers, Chicago, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Dec. 10, 1973, Ser. No. 423,545
Int. Cl. H01h *1/44*
U.S. Cl. 200—48 R 14 Claims

1. A high voltage electrical switch arrangement comprising:

a remote electrical contact connected to a portion of an electrical circuit;

an electrically conductive switch blade for engaging said remote electrical contact and having gear engaging means substantially the length of said blade;

an actuating means connected to another portion of an electrical circuit for linearly moving said switch blade to engage and disengage the switch blade with the remote electrical contact to open and close the electrical circuit;

said actuating means comprising:

an idler shaft;

a direction selecting lever connected to said idler shaft;

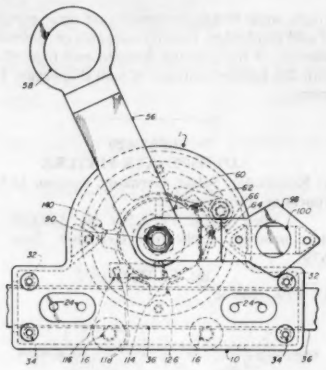
a hollow drive shaft mounted for rotation around said idler shaft;

an actuating lever mounted on said drive shaft;

a drive lever having a first and second end mounted at a first end to said drive shaft;

first and second oppositely directed drive pawls mounted on the second end of said drive lever;

a drive cam means for being engaged by said first and second drive pawls and being rotated by said first and second pawls in response to movement of said actuating lever;



a rotatably mounted gear connected to said drive cam, said gear having regularly spaced teeth to engage said engaging means to move said switch blade linearly in response to rotation of said gear and drive cam;

directional cam means connected to said idler shaft, said directional cam means for placing said first drive pawl into contact with said drive cam in response to positioning of said direction selecting lever in a first selected direction so that said switch blade will move in the first selected direction in response to ratcheting movement of said actuating lever and for placing said second drive pawl into contact with said drive cams in response to positioning of said direction selecting lever in a second selected direction so that said switch blade will move in the second selected direction in response to ratcheting movement of said actuating lever.

3,855,434
SHORTING DEVICE FOR GENERATOR OUTPUT LINES

Gerhard Grunert, and Erwin Hartmann, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 12, 1973, Ser. No. 369,228
Claims priority, application Germany, June 23, 1972, 2030900
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B 4 Claims

1. A shorting device for shorting an output bus bar of a generator to a shorting bar comprising:

a. a contact arm electrically connected to the shorting bar;

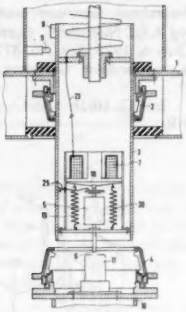
b. a mating contact electrically connected to the output bus bar;

c. means to permit said contact arm to move in and out of engagement with said mating contact;

d. a vacuum switching tube having a set of contacts in an evacuated chamber one of which is connected to said contact arm and another connected to an extending

contact, said switching tube mounted for motion along with said contact arm;

e. an advance contact electrically coupled to said mating contact and arranged to mate with said extending contact, the arrangement being such that upon moving said contact arm from an open to a closed position, said extending contact will engage said advance contact before said contact arm engages said mating contact; and



f. means to operate said set of contacts in said evacuated chamber such that said contacts are open over the portion of movement during engaging and disengaging corresponding to that just prior to engagement and just before disengagement of said extending contact with said advance contact and closed during the portion of remaining movement where said extending contact is engaging said advance contact but said contact arm is not engaging said mating contact.

3,855,435

SOLID INSULATED BREAKER OF A SMALL SIZE

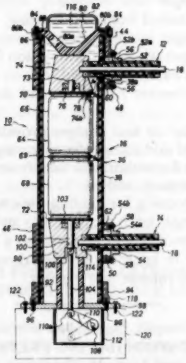
Hitoshi Himi, Tokyo, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Oct. 30, 1973, Ser. No. 411,068

Claims priority, application Japan, Nov. 1, 1972, 47-109670

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **20 Claims**



1. A solid state material insulated breaker of a small size comprising a main cylinder of electrically insulating solid state material and sealed at the first and second ends thereof, said main cylinder having two openings longitudinally spaced from each other in the wall thereof, a breaker unit enclosed in said main cylinder and having a movable and a fixed contacts therein, means for fixing said breaker unit in said main cylinder, two insulated electric conductors inserted through said two openings of said main cylinder, one ends of which conductors are electrically connected respectively to said fixed and movable contacts of said breaker unit, each insulated conductor including an elongated, electric conductor and a solid insulating material layer formed around thereof in a fixed thickness, means for attaching said insulated conductors, respectively, to said main cylinder and a insulating material filled into the space between said sealed main cylinder and said breaker enclosed therein.

3,855,436

COMPRESSED-GAS CIRCUIT BREAKER

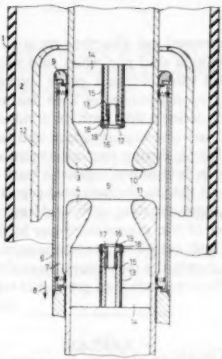
Heiner Marin, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 1, 1973, Ser. No. 328,676

Claims priority, application Germany, Feb. 17, 1972, 2208035

Int. Cl. H01h *33/80*

U.S. Cl. 200—148 R **4 Claims**



1. In a compressed-gas circuit breaker wherein a flow of quenching medium is directed toward the arc developed when the breaker is switched to the off position, a switching contact arrangement comprising: two hollow, nozzle-shaped contacts disposed on a common axis, said contacts being spaced from each other to conjointly define a gap therebetween across which the arc is drawn; and a substantially cylindrical arcing electrode centrally mounted in at least one of the hollow contact and set back from the nozzle opening of the hollow contacts, the arcing electrode defining an end-face contact surface for receiving the foot point of the arc driven thereon by the action of the quenching medium during the switch-off operation, said arcing electrode being covered with insulating material on the outer surface thereof up to said end-face contact surface thereby confining the action of the arc on said arcing electrode to said contact surface.

3,855,437

ELECTRIC COMPRESSED-GAS CIRCUIT BREAKER

Heiko Goedecke; Klaus-Peter Rolff, and Friedrich Richter, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 22, 1973, Ser. No. 344,043

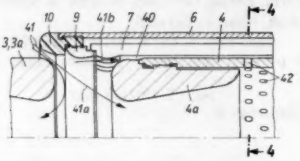
Claims priority, application Germany, Mar. 27, 1972, 2215656

Int. Cl. H01h *33/82*

U.S. Cl. 200—148 R **22 Claims**

1. In an electric compressed-gas circuit breaker, a contact arrangement comprising: two stationary mutually adjacent

contact pieces; a bridging switching unit movable between closed and open positions for electrically bridging said contact pieces in the closed position and for electrically disconnecting said contact pieces in the open position whereby an arc develops when said switching unit is moved to the open position, said switching unit being mounted on one of said contact pieces so as to define a gap between said switching unit and the other one of said contact pieces when said switching unit is moved to said open position; a slide contact ring of arc-resistant material mounted on said bridging switching unit for slideably engaging said other contact piece in the closed position and for being in spaced relation to said contact piece across said gap when said switching unit is moved to the open



position; compressed-gas chamber means for blasting compressed-gas through said gap when said switching unit separates from said other contact piece during the movement thereof to said open position; at least said one contact piece being hollow to define a flow path for conducting the gas away from the gap; said one contact piece and said switching unit conjointly defining, during the movement of said switching unit to said open position, a region at least partially shielded from the flow of the gas through said gap; and, auxiliary passage means communicating with said region for causing at least a portion of the compressed-gas to flow through said region when said switching unit separates from said other contact piece during the movement thereof to said open position whereby flow stagnation of gas in said region is prevented.

3,855,438

ARRANGEMENT FOR THE OPERATION OF SWITCHING DEVICES IN TELEPHONE EQUIPMENT

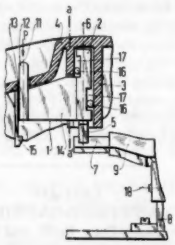
Karl-Jan Breu; Herbert Hoher, both of Munich, and Hans-Joachim Schinke, Bocholt, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sept. 20, 1973, Ser. No. 399,270

Claims priority, application Germany, Sept. 25, 1972, 2246993

Int. Cl. H01h *3/00*

U.S. Cl. 200—153 R **2 Claims**



1. In apparatus for mechanically transmitting an externally applied force to switching means placed within a housing or the like through intermediate member means connecting the point of application of said force to said switching means and moving rectilinearly in a guideway between two extreme positions, said intermediate member means extending through at least one opening in said housing, the improvement comprising:

first and second areas on said intermediate member means for absorbing said externally applied force, and transmitting it, said first and second areas being physically separated from each other, said first and second areas having axes of rotation, respectively in a laterally staggered spatial relationship with respect to each other.

3,855,439

KEY SWITCH

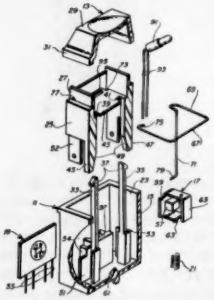
Hans Hermann, Nuernberg, Germany, assignor to Triumph Werke Nuernberg A.G., Nuernberg, Germany

Filed July 6, 1973, Ser. No. 377,038

Claims priority, application Germany, July 6, 1972, 2233170

Int. Cl. H01h *13/64*

U.S. Cl. 200—159 R **5 Claims**



1. A key switch construction convertible from a momentary to a latching switch comprising an upwardly open box-like housing,

a downwardly open box-like plunger telescopically mountable for movement in said housing,

said plunger and housing having cooperating switching elements mounted thereon, operable to effect switching when said plunger is depressed,

a spring mounted in said housing acting on said plunger to maintain it in a raised position and return said plunger following a depression and release of said plunger,

means on said housing and plunger for limiting depression of said plunger and releasably latching said plunger against withdrawal from said housing,

a resilient plunger latching element removably mountable on said plunger whenever conversion from a momentary to a latching switch is desired,

said latching element having an end depending into said housing,

a removable cap on said plunger providing for access into the interior of said plunger for releasing said plunger from said housing for withdrawal therefrom and for mounting said latch element, and

a slot in said housing for guiding the end of said mounted resilient plunger latch element into and out of a detented position respectively in response to a first depression of said plunger to latch the plunger down and to a second depression to release said plunger.

3,855,440

MICROWAVE OVEN HAVING PREFERRED MODES

James E. Staats, and Louis H. Fitzmayer, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jan. 4, 1974, Ser. No. 430,730

Int. Cl. H05b *9/06*

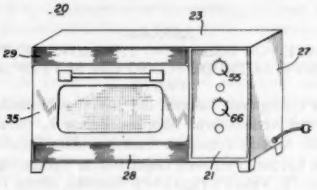
U.S. Cl. 219—10.55 F **21 Claims**

1. Electronic heating apparatus comprising a metal enclosure including six rectangular walls arranged to form a rectangular parallelepiped defining a heating cavity for receiving

therein a body to be heated, and source means for transmitting microwave energy of a predetermined wavelength through one of said walls into said heating cavity for exciting therein a predetermined electromagnetic field mode, said one wall having an electrical dimension D such that

$$D \quad 1.1\, n\, \lambda/2$$

wherein n is any integer and λ is said predetermined wavelength, said predetermined electromagnetic field mode having the fields thereof constant in directions normal to said one wall with power flow being parallel to the direction of the dimension D, whereby there is established in said heating cavity an electromagnetic field pattern providing uniform heating of an associated body.

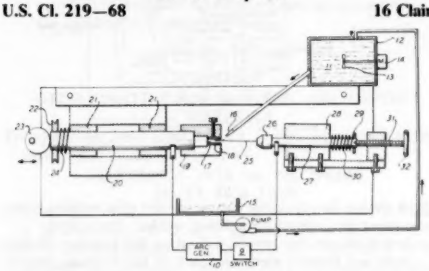


3,855,441

METHOD AND APPARATUS FOR ACTIVATION OF AN ABRASIVE SLURRY BY AN ELECTRIC ARC

Carl E. Kimmelmann, White Twp., Warren County, N.J., assignor to David B. Braelow, West Orange, N.J., a part interest

Filed Apr. 8, 1974, Ser. No. 459,080
Int. Cl. B23p *1/00*
U.S. Cl. 219—68 **16 Claims**



1. A method for reducing a surface of a workpiece comprising:

a. supplying a dielectric, abrasive slurry to a portion of a workpiece to be reduced;

b. generating successive electric arcs in the slurry to move it at the portion of the workpiece to be reduced;

c. reducing the surface of the workpiece by the movement of the abrasive slurry.

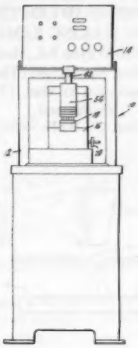
3,855,442

ELECTRODE SUPPORTING CARTRIDGE ASSEMBLY FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

John M. Check, Chelsea, and Gary F. Rupert, Ann Arbor, both of Mich., assignors to Raycon Corporation, Ann Arbor, Mich.

Division of Ser. No. 113,410, Feb. 8, 1971, Pat. No. 3,729,609. This application Feb. 13, 1973, Ser. No. 332,073
Int. Cl. B23p *1/08*
U.S. Cl. 219—69 E **6 Claims**

1. An electrode supporting cartridge assembly for electrical discharge machining apparatus comprising a cartridge member having substantially parallel grooves therein, a plurality of substantially parallel electrodes slidably mounted in a side-by-side relation in said grooves, electrode retainer means mounted on said cartridge member and engaged with said electrodes so as to retain said electrodes in said grooves, and



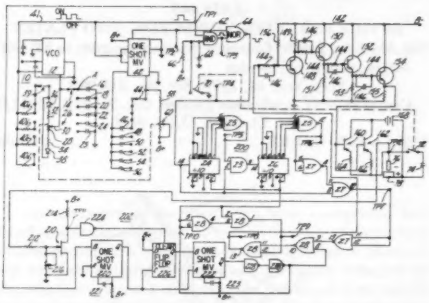
electrode guide means located at one end of said cartridge member in close proximity thereto and disposed in a guiding relation with said electrodes.

3,855,443

GAP SENSING CIRCUIT FOR ELECTRICAL DISCHARGE MACHINING APPARATUS

Oliver A. Bell, Jr., Mooresville, and Randall C. Gilleland, Statesville, both of N.C., assignors to Colt Industries Operating, New York, N.Y.

Continuation-in-part of Ser. No. 373,377, June 25, 1973, Pat. No. 3,832,511. This application Oct. 1, 1973, Ser. No. 402,314
Int. Cl. B23p *1/08*
U.S. Cl. 219—696 **9 Claims**



1. In an electrical discharge machining power supply having an electronic output switch connected to the output of a pulse generator and operatively connected to a DC source and the gap for providing machining power pulses thereto, a gap short circuit protection system comprising:

a normally non-conductive electronic switch having its control electrode operatively connected with the gap for triggering into conduction responsive to abnormal gap voltage level and providing an output signal representative of gap short circuit; and

a gating means responsive to said signal for passing a series of machining power pulses from said pulse generator during gap short circuit condition, said pulses of said series of the same duty cycle and frequency as the normal machining power pulses supplied to the gap, said gating means further operable to interrupt machining power pulses between each different series for a relatively long

interval for the continued duration of the gap short circuit condition.

3,855,444

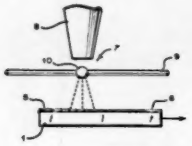
METAL BONDED NON-SKID COATING AND METHOD OF MAKING SAME

Maximilian Palena, 1000 Wayne Rd., Haddonfield, N.J. 08033

Filed Dec. 16, 1968, Ser. No. 783,901The portion of the term of this patent subsequent to Mar. 17, 1987, has been disclaimed.

Int. Cl. B23k *9/04*

U.S. Cl. 219—76 **6 Claims**



1. A method of producing a non-skid, or anti-slip, surface on a sheet of metal which comprises the steps of depositing a loose layer of grit particles on a surface of the sheet, projecting droplets of metal in a softened condition onto the particles of grit without substantially displacing said particles with respect to each other or with respect to said sheet so as to establish an incomplete and partially fused metallic bond between the particles of grit and said sheet, and thereafter forcibly projecting hot molten metal against the upper surface of said incompletely bonded particles of grit with a velocity and at a temperature sufficient to at least partially remelt the metal initially applied to said grit and establish a secure bond between said particles and said sheet of metal.

3,855,445

DEVICE FOR INTERCONNECTING TWO PLATES

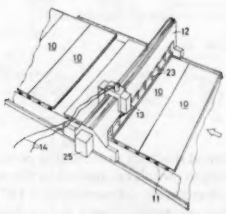
Nils Ake Curt Jungle, Goteborg, Sweden, assignor to AB Gotaverken, Goteborg, Sweden

Filed Nov. 14, 1973, Ser. No. 415,903

Claims priority, application Sweden, Dec. 7, 1972, 15931/72

Int. Cl. B23k *15/00, 9/16*

U.S. Cl. 219—121 EB **3 Claims**



1. In a device for interconnecting two horizontally arranged plates including a carrier straddling the plates, a welding apparatus having a main part and a head piece movable along said carrier, a channel shaped member for covering the welding seam on top of, as well as below the plates and an air extractor connected to the space between the channel shaped members, the improvement that the channel shaped member to be used on top of the plates includes first and second parallel beams located at some distance from each other, as well as a laterally directed fin or pliable material at each beam, said fins overlapping each other to fully cover the distance between the beams and being sufficiently deformable to permit the head piece of the welding apparatus to move longitudinally between the beams, without causing any noticeable entrance of air, the head piece forming part of an electron beam welding apparatus and being carried by the second beam, and first and second sets of pressure fluid operated rams fitted at the carrier for moving each of said beams towards and away from the plates.

3,855,446

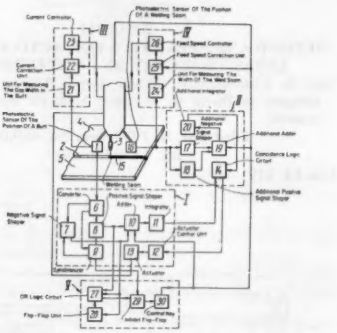
DEVICE FOR DIRECTING THE MOVEMENT OF WELDING ELECTRODE ALONG THE BUTT OF JOINING PARTS

Valentina Georgievna Kotova, ulitsa V. Vasilievskoi, 17, kv. 89; Gretel Artashesovna Akopian, Bulvar L. Ukrainki, 12, kv. 130; Anatoly Ivanovich Galitsky, ulitsa Serafimovicha, 13a kv. 13; Jury Petrovich Golin, Bulvar Verkhovogo Soveta 94a. kv. 72; Valery Grigorievich Snezhko, ulitsa, 13/14, kv. 64; Leonid Georgievich Kolesnichenko, Obruschskaya ulitsa 13/14, kv. 64; Larisa Akimovna Ivanenko, Brest- Litovsky prospekt, 78. kv. 69, and Jury Fedorovich Nekrasov, Polovetskaya ulitsa, 18, kv. 1, all of Kiev, U.S.S.R.

Filed Nov. 17, 1972, Ser. No. 307,533

Int. Cl. B23k *9/10*

U.S. Cl. 219—125 PL **5 Claims**



1. A device for directing the movement of a welding electrode along the joint of parts being welded, comprising:

a first photoelectric sensor indicating the position of said joint and located along the path of the welding process ahead of said welding electrode, the position of said first sensor corresponding to a predetermined position of the electrode;

a follow-up system for tracing the direction of movement of said welding electrode relative to said joint of said parts being welded, said system being connected to said sensor;

a converter in said follow-up system to convert the output signal of said photoelectric sensor into a train of rectangular pulses, the input of said converter being connected to the output of said photoelectric sensor;

a negative signal wave shaper in said follow-up system corresponding to the right-hand position of said photoelectric sensor relative to the axis of said joint of said parts being welded, when viewed in the direction of the welding process, the input of said shaper being connected to the output of said converter;

a positive signal wave shaper in said follow-up system, corresponding to the left-hand position of said photoelectric sensor relative to the axis of said joint of said parts being welded, when viewed in the direction of the welding process, the input of said shaper being connected to the output of said converter;

a synchronizer in said follow-up system and having an input connected to said output of said converter, the output of said synchronizer being connected, respectively, to the

other inputs of said positive and negative signal shapers;
an adder in said follow-up system and having inputs connected to respective outputs of said positive and negative signal shapers;
an integrator in said follow-up system and having an input connected to the output of said adder;
a seoncd photoelectric sensor indicating the position of the weld seam and arranged behind said electrode when viewed in the direction of the welding process, said second photoelectric sensor being rigidly connected to said electrode;
a control system to control the movement of said welding electrode relative to the axis of said weld seam, said control system being connected to said second photoelectric sensor indicating the position of the weld seam;
auxiliary wave shapers in said control system to shape positive and negative signals corresponding to the right-hand and left-hand positions of said second photoelectric weld seam position sensor relative to the axis of the weld seam when viewed in the direction of the welding process, the inputs of said auxiliary shapers being connected to the output of said second photoelectric weld seam position sensor;
an auxiliary adder in said control system and having inputs connected to respective outputs of said auxiliary shapers;
an auxiliary integrator in said control system and having an input connected to the output of said auxiliary adder;
a logic coincidence circuit in said control system and having a first input connected to the output of said auxiliary integrator and having a second input connected to the output of said integrator in said follow-up system;
actuating means in said follow-up system, for moving said welding electrode;
a control unit to control said actuating means and having an input connected to the output of said logic coincidence circuit, the output of said control unit being connected to the input of said actuating means.

3,855,447
WELD ADDITIVE FOR ELECTRIC-ARC DEPOSIT WELDING

Frithjof Ernst Josef Kilp, Viersen, Germany, assignor to Herman C. Starck, Berlin, Germany

Filed May 21, 1973, Ser. No. 296,654
Int. Cl. B23k *35/00*
U.S. Cl. 219—145 **3 Claims**

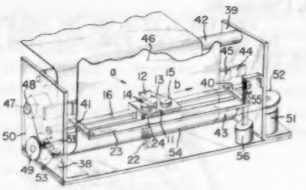
1. In a welding rod or wire, an improved weld additive for electric-arc deposition welding consisting essentially of the stoichiometric chromium carbide Cr_3C_2 with superstoichiometric quantities of elemental carbon distributed in the lattice of the Cr_3C_2 to ensure a carbon content of **15** to **25** percent by weight in the additive.

3,855,448
RECORDING APPARATUS

Takayoshi Hanagata, Yokohama, and Suminobu Yamada, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1973, Ser. No. 343,866
Claims priority, application Japan, Mar. 27, 1972, 47-30462
Int. Cl. H05b *1/100*
U.S. Cl. 219—216 **10 Claims**

1. A recording apparatus comprising:
a thermal head having a plurality of islands generally disposed in a common plane, said islands being thermally independent of one another and capable of heating separately and selectively by electrical signals;
a print member, disposed opposite to said islands, comprising a heat-resistant back-up layer and a thin film formed of an adhesive resin of low melting point disposed over said back-up layer;
recording paper disposed to face the thin film of said print member and being free of any material which is thermosensitive for coloring;
means for urging said thermal head against said print member for bringing all of said plurality of islands into intimate contact with said heat-resistant back-up layer and

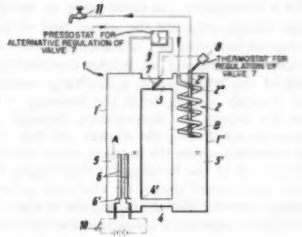


said film into intimate contact with said recording paper; and
means for producing said electrical signals to selectively heat said plurality of islands so as to melt the corresponding part of said adhesive resin to transfer it onto said recording paper.

3,855,449
ARRANGEMENT FOR PRODUCING HEAT

Karl Heinz Schneider, Hauptstrasse 174, 5628 Heiligenhaus, Germany

Filed Dec. 20, 1972, Ser. No. 316,714
Claims priority, application Germany, Dec. 28, 1971, 2164956
Int. Cl. H05b *3/60;* **F24h** *1/16*
U.S. Cl. 219—287 **12 Claims**



1. An arrangement for producing heat, comprising two closed vessels each of which contains a quantity of electrolyte in liquid phase and a quantity of electrolyte in vapor phase; at least one heat exchanger in one of said vessels arranged to have admitted therein a medium to be heated, at least part of said one heat exchanger being located in the electrolyte vapor of said one vessel; electrodes in the other of said vessels and being at least in part located in the liquid electrolyte of said other vessel, said electrodes being adapted to be connected with a source of electrical energy for vaporizing the liquid electrolyte in said other vessel; a first flow connection between said vessels for vaporized electrolyte to flow from said other vessel to said one vessel; a second flow connection between said vessels for liquid electrolyte to flow between said vessels; and valve means interposed in at least said first flow connection for regulating the flow of electrolyte in either phase between said vessels, said valve means having an open position for permitting vaporized electrolyte to flow from said other vessel to said one vessel and a closed position for preventing the flow of vaporized electrolyte from said other vessel to said one vessel, and means for actuating said valve means to said open position so as to permit the vaporized electrolyte to flow into said one vessel and contact said part

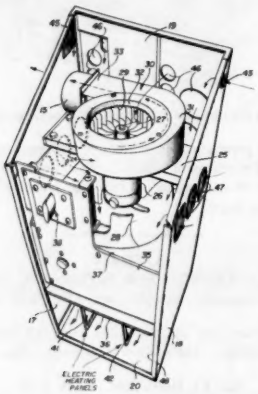
of said one heat exchanger to thereby heat the medium in said one heat exchanger.

3,855,450

LOCOMOTIVE ELECTRIC CAB HEATER AND DEFROSTING UNIT

Jon F. O'Connor, Evanston, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Oct. 1, 1973, Ser. No. 402,371
Int. Cl. H05b *1/02;* **F24h** *3/04;* **B60h** *1/22*
U.S. Cl. 219—367 **8 Claims**



1. A locomotive electric cab heater and window defroster unit for a locomotive cab comprising an upright housing, an air inlet means adjacent the upper end of the housing for receiving recirculating air, a centrifugal blower adjacent the air inlet means having an intake communicating with the interior of the housing and a discharge connected to a defroster conduit leading from the housing, a fan below the blower for driving air downwardly through the housing, a common motor driving the blower and fan, electric heating panels mounted within the housing below the fan, an outlet at the lower end of the housing for discharging heated air into the cab, and control means for said unit including means for reducing power to the heating panels in the event the motor falls whereby convective air movement upwardly through the housing between the lower opening and the upper intake continues to provide heat to the cab.

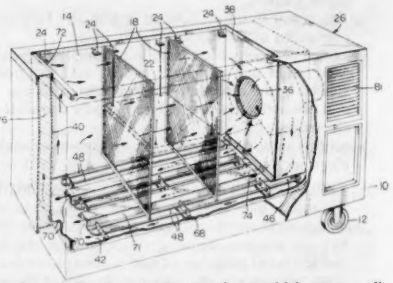
3,855,451

FOOD HEATING AND WARMING CABINET

Robert E. Lee, Huntington, Ind., assignor to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed May 2, 1974, Ser. No. 466,270
Int. Cl. A21b *1/22;* **F27d** *11/02*
U.S. Cl. 219—400 **12 Claims**

1. In an electrically heated insulated cabinet for heating packets of foodstuff preparatory to serving; a frame, an upwardly opening well formed in said frame having vertical side walls and end walls and a horizontal bottom wall, laterally extending perforated vertical partition means removeably mounted in said well and dividing the well into compartments, lid means for closing the well, a blower in said frame outside one end wall of said well having an inlet opening into said well through said one end wall for circulating the air within the well to heat the packets of foodstuff, outlet means for said blower at the bottom of said one end wall whereby said blower expels air horizontally over the bottom wall of the well toward the other end wall of the well, electric heaters extending longitudinally above said bottom wall in laterally spaced relation and within the range of the air discharged by said blower, and tunnel members mounted on said bottom wall between said



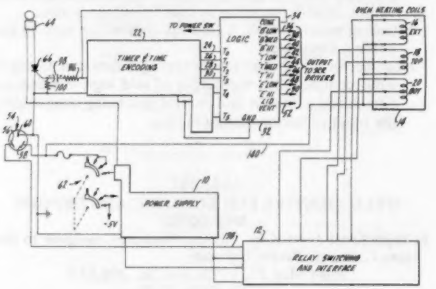
heaters and extending longitudinally along said bottom wall and having open ends spaced inwardly from said end walls.

3,855,452

KILN HEATING CONTROL SYSTEM

Michael D. Flasza, 3302 S. 59th Ave., Cicero, Ill. 60650, and Leonard Osuch, 3077 N. Elbridge Ave., Chicago, Ill. 60618

Filed Nov. 29, 1973, Ser. No. 420,151
Int. Cl. H05b *1/02*
U.S. Cl. 219—486 **7 Claims**



1. A control system for an electrically heated ceramic kiln including a plurality of heating coils, a plurality of switching elements connected to said coils, there being at least two switching elements for each coil to provide at least two heating levels for each coil,

timing means for providing periodic controlled output time signals, and logic means connected to said timing means and to said switching elements, with sequential time signals providing predetermined outputs from said logic means to cause the operation of predetermined switching elements.

3,855,453

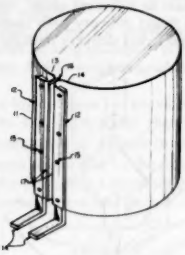
APPARATUS FOR CONTROLLED QUENCHING OF MELT EXTRUDED FILAMENTS

Don P. Manning, and Thomas A. Flower, both of Colonial Heights, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Division of Ser. No. 836,553, June 25, 1969, abandoned. This application Aug. 13, 1971, Ser. No. 171,717
Int. Cl. H05b *3/10*
U.S. Cl. 219—553 **6 Claims**

1. An improved apparatus for critically controlling the rate of cooling melt extruded filaments which comprises a sleeve constructed from a material having an electrical resistivity of 60 to 675 ohms per circular mil-foot, axial length of the sleeve being about 1 to 12 inches, diameter of the sleeve being about

3 to 20 inches, and thickness of the material from which the sleeve is constructed being about 0.001 to 0.125 inch, said sleeve being equipped with an electrical power supply input



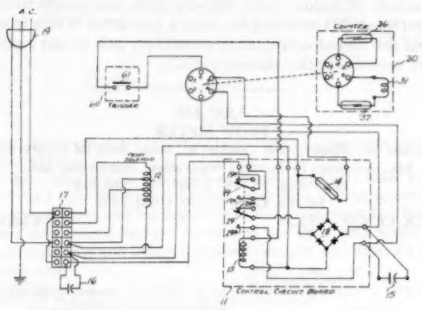
means for heating said sleeve to provide a heated environment within said sleeve, whereby the temperature of said sleeve is maintained at about 200° to 525°C. thereby creating said heated environment within said sleeve at about 175° to 450°C.

3,855,454

VALIDATING SYSTEM AND METHOD

Irving A. Eisen, 9516 Clement Rd., Silver Spring, Md. 20904, and Gerard Maresca, 823 Sixth Ave., New York, N.Y. 10009

Filed Dec. 12, 1972, Ser. No. 314,330
Int. Cl. G06m *3/02*
U.S. Cl. 235—92 CT **14 Claims**



1. A validating system for parking tickets and the like comprisingg in combination:

a. a validator adapted to receive tickets to be validated, including:

i - means for impressing validating indicia on said tickets;

ii - normally open first switch means for rendering said impressing means inoperative; and

iii - trigger means for actuating said validating means when a ticket is inserted in said validator;

b. socket means mounted in said validator for pluggably receiving a counter; and

c. counter means charged with a predetermined number of validation units, mounted in said socket means for enabling said impressing means, including:

i - means for registering a count representative of said predetermined number of units comprising a plurality of rotatably mounted geared number wheels;

ii - means for reducing said count by one unit each time a validation is made;

iii - means for closing said first switch means when said counter means is inserted in said socket means;

iv - second magnetically responsive switch means in circuit with said trigger means for rendering said trigger mans inoperable when said predetermined number of validation units have been exhausted;

v - third magnetically responsive switch means for rendering said reducing means inoperble when said predetermined number of validation units have been exhausted; and

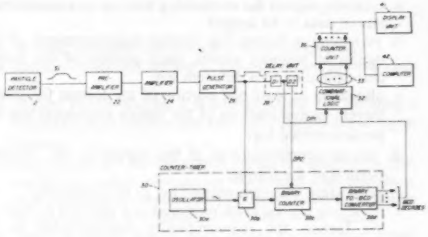
vi - rotatably mounted magnetic means actuated by said count registering means and means for rotating said magnetic means 90° with respect to said second and third switch means in response to a predetermined rotation of one of said number wheels for causing said second and third switch means to open when said predetermined number of validation units have been exhausted.

3,855,455

SIGNAL ANALYZER

Hubert B. Allinger; Glen G. Gray; Robert S. Indre, and Robert J. Kelly, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 18, 1973, Ser. No. 324,634
Int. Cl. G06m *11/04*
U.S. Cl. 235—92 PC **3 Claims**



1. A signal analyzer for automatically generating data related to the distribution of lengths of fibers suspended in a liquid medium, said analyzer comprising:

detector means comprising means adapted for immersion in said medium and having an orifice for detecting the passage of fibers therethrough and for generating a train of detector output pulses in accordance therewith, the duration of said pulses being proportional to the length and velocity of said detected fibers through said orifice, and to the thickness of said orifice;

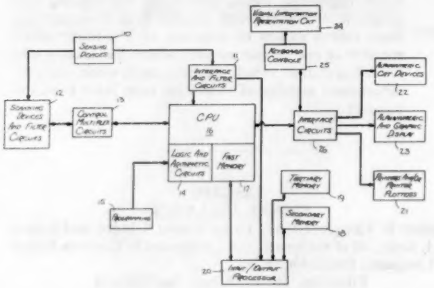
means responsive to said detector output pulses for determining the time duration of each pulse, each of said durations being representative of weighted mean fiber length, and said means comprising oscillator means for generating a signal of predetermined frequency, gating means for controlling the transmission of said predetermined frequency signal in accordance with the duration of said output pulses, counter means for counting the number of cycles in each of the output signals of said gating means, and means for converting the output of said counter means into corresponding digital coded signals; counter means responsive to said coded signals for counting the number of digital codes representing values within each of a plurality of value ranges; and

means for converting the counts in said counting means into data representing a distribution of lengths of fibers suspended in said liquid medium.

3,855,456
MONITOR AND RESULTS COMPUTER SYSTEM

William A. Summers, North Haledon; Betty L. Christy, Radburn, both of N.J., and Joseph V. Sweeney, Manhasset, N.Y., assignors to Ebasco Services Incorporated, New York, N.Y.

Filed Nov. 22, 1972, Ser. No. 308,770
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.3 95 Claims



1. A method of producing at least one log of data containing at least one line having provision for at least one value representing a bit of data to be logged in a monitoring and operations display system, the method comprising:

a. receiving signals for monitoring devices corresponding to bits of data to be logged;

b. providing a format for storing representations of the signals in memory means, each portion of the format corresponding to a different log;

c. allocating at least one portion of the format for storing therein representations of the signals corresponding to a predetermined log;

d. storing representations of the signals in the allocated portion of the format;

e. requesting a predetermined log to be produced;

f. retrieving representations stored in a selected portion for the format, the representations corresponding to the predetermined log to be produced; and

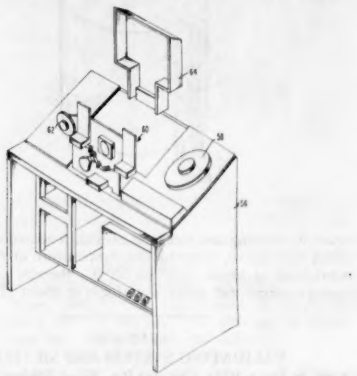
g. presenting on an output display means the data of the retrieved representations in the form of a log.

3,855,457
MACHINE FOR PROCESSING MERCHANDISING TICKETS IN BOTH ROLL AND INDIVIDUAL FORM

Lonald Lloyd Amundson, Rochester; Wallace Eric Beuch, Pine Island; Charles Donald Green, and William John Harris, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 18, 1973, Ser. No. 371,319
Int. Cl. G06k *7/08*; B22d *13/00*; B30b *1/00*; C10g *37/02*; B65g *3/04*
U.S. Cl. 235—61.11 D 6 Claims

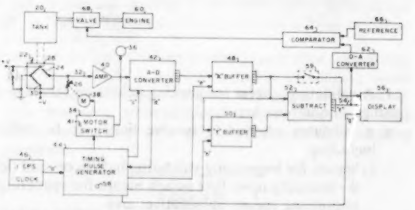
1. In a machine for processing merchandise tickets in both connected or roll form and separate or individual ticket form, means defining a main ticket path, an encoding head in said path for encoding information on a ticket moving in said path, a read head in said path located downstream in the direction of ticket movement in said path with respect to said write head for reading encoded information on a ticket in said path, a hopper for individual tickes, a supply reel for a roll of tickets, means defining a first supply path connecting said reel with said main path for supplying connected tickets to said main path, means defining a second supply path connecting said hopper with said main path for supplying individual tickets to said main path, a stacker for individual tickets, a take-up reel for tickets in connected form, means defining a connected ticket delivery path connecting said main path with said take-up reel for delivering tickets in connected form from said main path to said reel, means defining an individual ticket delivery path connecting said main path with said stacker for delivering individual tickets from said main path to said stacker, means defining an auxiliary individual ticket delivery path connected with said first named individual ticket delivery path for delivering individual tickets to a discard chute, means defining an auxiliary connected ticket delivery path connected with said first named connected ticket delivery path for delivering connected tickets exclusive of said take-up reel, a selectively operable ticket deflector for routing tickets from said main path to either said first named individual ticket delivery path or to said first named connected ticket delivery path, a selectively operable ticket deflector for routing individual tickets from said first named individual ticket delivery path to said auxiliary individual ticket delivery path, and a selectively operable ticket deflector for routing connected tickets from said first named connected ticket delivery path to said auxiliary connected ticket delivery path.



3,855,458
FLOW METER

James W. Motter, and Connie A. Allen, both of Huntsville, Ala., assignors to Toroid Corporation, Huntsville, Ala.

Filed Aug. 21, 1973, Ser. No. 390,201
Int. Cl. G01g *17/04*; G06j *3/00*
U.S. Cl. 235—151.34 8 Claims



1. A flow measurement system comprising:

weight measurement means adapted to be coupled to a container from which material is being dispensed and including means for providing a plurality of electrically indicated weight signals at regular, successive, predetermined times;

analog-to-digital conversion means responsive to said weight signals from said weight measurement means and responsive to first control signals for providing digital weight signals;

storage means including a digital storage means coupled to the output of said analog-to-digital converter for sequentially storing one said digital weight signal until the receipt of a second digital weight signal;

subtraction means responsive to a said digital weight signal from said analog-to-digital conversion means, a digital weight signal from said storage means, and a second control signal for providing a difference output representative of difference in weight between successive said digital weight signals;

first control logic means for providing said first control signals to said analog-to-digital conversion means for providing said digital weight signals at selected intervals of time;

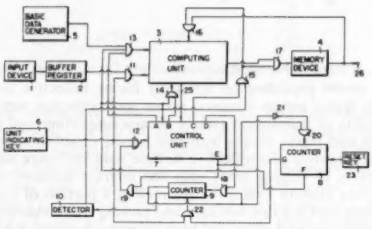
second control logic means for providing said second control signal to said subtraction means for providing an output representative of difference in weight; and

transducer means responsive to the output of said subtraction means for providing a discrete output representative of said difference output and thus rate of flow of material.

3,855,459
APPARATUS FOR CONVERTING DATA INTO THE SAME UNITS

Masayuki Hakata, Iruma, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1972, Ser. No. 299,823
Claims priority, application Japan, Oct. 23, 1971, 46-84187
Int. Cl. G06f *3/02*
U.S. Cl. 235—154 **1 Claim**



1. Apparatus for converting input data into the same units, comprising:

data input means supplying data expressed in a basic unit and data expressed in a unit other than said basic unit;

an operation unit connected to receive the output data from said data means, and for converting the input data which is expressed in a unit other than said basic unit into data of said basic unit;

memory means coupled to said operation unit for storing the output of said operation;

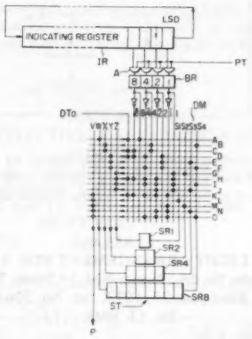
unit indicating means for generating signals corresponding to respective units of said input data, said unit indicating means including a unit indicating input key, a first counter coupled to said unit indicating input key and which is shifted by plus one each time said unit indicating input key is operated, a second counter coupled to said first counter to set therein the contents of said first counter, and means coupled to said second counter for shifting the contents of said second counter by minus one each time said operation unit performs said conversion of units; and

control means responsive to the signals generated by said unit indicating means, said control means including means for storing said input data in said memory means when said unit indicating means produces a signal corresponding to the basic unit of said input data, means for causing said operation unit to convert the input data which is expressed in a unit other than said basic unit into data of said basic unit when said unit indicating means produces a signal indicating that the input data is expressed in said unit other than said basic unit, means for causing said operation unit to add said converted data to said data which has been stored in said memory means, and means for storing the result of said addition operation in said memory.

3,855,460
STATIC-DYNAMIC CONVERSION SYSTEM

Ichiro Sado, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 9, 1973, Ser. No. 377,255
Int. Cl. G06f *1/04*
U.S. Cl. 235—156 **4 Claims**



1. A static-dynamic conversion system comprising:

a. storage means for storing a static digit position information,

b. means for producing a reference signal for defining a reference digit position for said static digit position information,

c. selecting means having matrix means for selectively storing binary coded information associated with said static digit position information, said binary coded information being read out in response to said reference signal,

d. delaying means having shift means for delaying output signal derived from said selecting means, whereby said reference signal is delayed by the time corresponding to said static digit position information stored in said storage means, thereby converting said static digit position information into dynamic time-sequential information.

3,855,461
CALCULATOR WITH KEY CODE ASSOCIATION AND DISPLAY FEATURES

Richard Kent Stockwell, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 30, 1973, Ser. No. 393,081
Int. Cl. G06f *7/38, 15/02*
U.S. Cl. 235—156 **12 Claims**

1. An electronic calculator comprising:

an input unit, including control elements and including a plurality of keys having unique key codes, for controlling the calculator and entering information into the calculator, respectively;

an encoder unit coupled to the input unit for encoding information received therefrom;

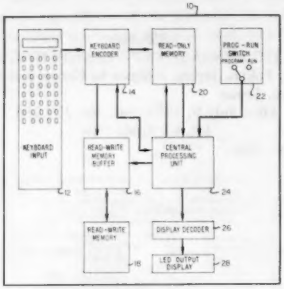
a first memory unit coupled to the encoder unit for storing encoded information received therefrom;

a second memory unit, coupled to the encoder unit, for storing microinstructions;

a computing unit, coupled to the encoder unit and the first and second memory units, responsive to encoded information from the encoder unit or the first memory unit for selectively performing one or more operations employing microinstructions stored in the second memory unit; and

output display means, coupled to the computing unit, for

displaying the results of operations performed by the calculator and for displaying key codes;



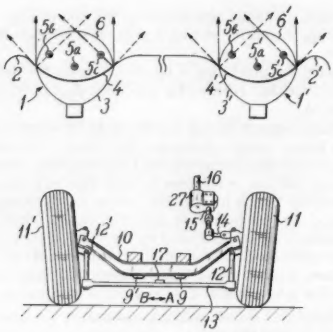
said computing unit being responsive to actuation of a control element for causing the key code of the last key actuated to be displayed by the output display means.

3,855,462

HEAD LIGHT ARRANGEMENT FOR A VEHICLE

Takasi Kondo, No. 25-5 Narita-Nisi, 1-Chome, Tokyo, Japan

Filed Jan. 23, 1973, Ser. No. 326,035
Int. Cl. B60q *1/12*
U.S. Cl. 240—8.24 **3 Claims**



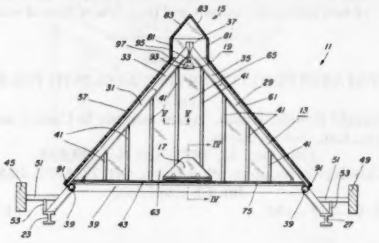
1. A head light arrangement for a vehicle having a steering system including a front axle and a tie rod, comprising a pair of headlights each including a central light bulb and right-hand and left-hand light bulbs disposed laterally of said central light bulb and reflector means for each of said headlights, said reflector means each arranged so that illumination from each of said central light bulb is directed in a straightforward direction, and illumination from one of said right-hand and left-hand light bulbs of each of said headlights is directed in a rightward direction, and illumination from the other of each of said right-hand and left-hand light bulbs of each of said headlights is directed in a leftward direction; a power source to energize said head lights; selective switching means to select the energization of said right-hand and left-hand light bulbs of each of said headlights; and an actuator for actuating said selective switching means to effect the selection of said right-hand and left-hand light bulbs of each of said headlights responsive to steering movement of a steering system of said vehicle said selective switching means comprises two magnetically operated switches mounted on a front axle of said steering system in a spaced relationship to each other and wherein said actuator comprises a permanent magnet mounted on a tie rod of said steering system intermediate of said spaced magnetically operated switches, said spaced relationship to each other of said two magnetically operated switches being so that one of said switches is operated by said permanent magnet when the latter together with said tie rod moves a sufficient distance for said vehicle to turn the corner of the road on which said vehicle is running.

3,855,463

TRANSILLUMINATED PYRAMIDAL-SHAPED SUPERSTRUCTURE

Joe W. Fowler, B2 Box 39, Reidsville, N.C. 27320

Filed Mar. 9, 1970, Ser. No. 17,793
Int. Cl. F21v *33/00, 5/02;* **E04d** *13/03*
U.S. Cl. 240—9 A **7 Claims**



1. A transilluminated superstructure for a building comprising means providing an upwardly facing reflective surface, open frame means disposed above said reflective surface, a plurality of translucent panels, means supporting said panels from said frame means with said panels establishing a large enclosure over said reflective surface, said enclosure having a plurality of sloping sides with the interior surfaces thereof defining plenum means for redirecting a portion of the light striking said interior surfaces and passing the remaining portion through said sides, and high intensity discharge type light source means mounted in said enclosure centrally of said reflective surface for providing light to said plenum means; said panels including flanges along their opposite side edges, and said panels being arranged side-by-side with a said flange on one panel being adjacent a said flange on an adjacent panel, and said means supporting said panels including means holding pairs of said adjacent flanges together.

3,855,464

ELECTRIC LIGHT-TO-CANDLE LIGHT CONVERTER

Stanley J. Angelo, Valmont Towers, Apt. 311, 7600 Roosevelt Blvd., Philadelphia, Pa. 19152

Filed June 4, 1973, Ser. No. 367,035
Int. Cl. F21v *21/00*
U.S. Cl. 240—53 **5 Claims**

1. In combination with a conventional electric light fixture including a conventional threaded electric light socket for

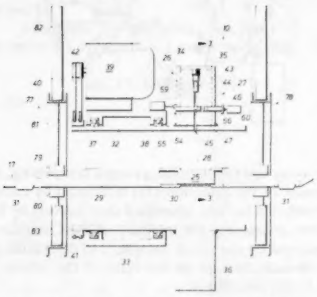
holding a conventional electrically operated threaded bulb therein, a converter for converting said fixture into a candle holding fixture without requiring the removal of any electrical or mechanical portion of the fixture other than the bulb, said converter comprising candle-holding means having a recess supporting a candle therein, said means including a base portion having threads thereon, with said base being directly screwed into the threaded mouth of the socket of said fixture.

3,855,465

APPARATUS FOR INSPECTING TUBULAR GOODS

David R. Tompkins, Houston, Tex., assignor to Plastic Applicators, Inc., Houston, Tex.

Filed Oct. 14, 1971, Ser. No. 189,306
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 R **16 Claims**



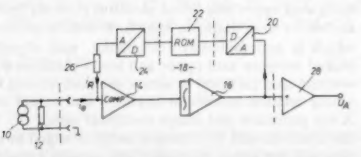
1. An inspection system comprising: radiation-emitting means adapted to direct a radiation beam through a test speciman along a selected axis for producing a uniform radiation pattern of known dimensions on a distant transverse plane intersecting said beam axis; and radiation-detecting means including a radiation-sensitive element having an active portion and adapted for movement along said plane between a normal position uniformly located in relation to said radiation pattern and at least one other position spaced from said normal position and located eccentrically in relation to said radiation pattern, said active portion of said radiation-sensitive element being cooperatively shaped for producing uniform output signals representative of at least one radiation-responsive characteristic of such a test speciman upon movements of said radiation-sensitive element between said spaced positions.

3,855,466

CIRCUIT ARRANGEMENT FOR LINEARIZATION OF THE CHARACTERISTIC OF A SENSOR

Karlhans Schwarz, Owingen, Germany, assignor to Bodenseewerk Geratetechnik GmbH, Uberlingen/Bodensee, Germany

Filed Jan. 23, 1974, Ser. No. 435,879
Claims priority, application Germany, Apr. 5, 1973, 2317023
Int. Cl. H01j *39/12*
U.S. Cl. 250—212 **3 Claims**



1. In an electronic apparatus for linearization of the output signal of a sensor having a given characteristic, which apparatus comprises an amplifier channel having an input and an output and a non-linear feedback loop around said channel, the improvement wherein said feedback loop comprises:

an analog-to-digital converter connected to said output to convert the signals from the channel output to digital form;

a read-only memory having the characteristic of said sensor stored therein, said memory being connected to said converter to receive said signals in digital form and to produce digital output signals corrected for temperature; and

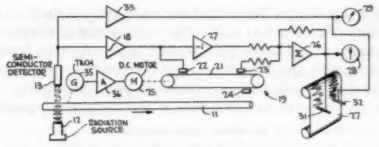
a digital-to-analog converter connected to said memory to convert said corrected signals to analog form, said digital-to-analog converter being connected to said channel input to apply said corrected signals in analog form to said input.

3,855,467

SYSTEM FOR EFFECTIVELY ENLARGING A DETECTOR WINDOW

Henry Roy Chope, Columbus, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Apr. 11, 1968, Ser. No. 720,688
Int. Cl. G01b *7/06*
U.S. Cl. 250—572 **25 Claims**



1. A combination of apparatus utilizing only a single detector for a property of physical matter, said property varying as a function of time and displacement, said detector and matter being moved relative to each other as a function of time, said detector being responsive simultaneously to said property in different portions of said matter which are spaced from each other over a continuum having a limited displacement spread for deriving a signal indicative, at any time, of the value of the property over said limited displacement spread, and means for converting said signal to an output signal which is responsive simultaneously to variations in said property occurring in different portions of said matter which are spaced from each other over a continuum having a displacement spread larger than said limited displacement spread.

3,855,468

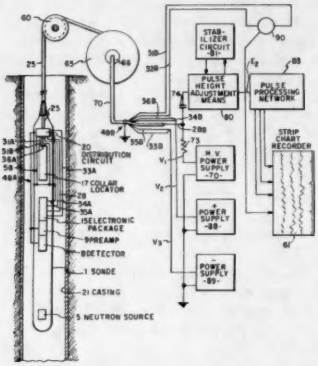
WELL LOGGING METHOD AND MEANS USING AN ARMORED MULTICONDUCTOR COAXIAL CABLE

Robert W. Pitts, Jr., Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 21, 1973, Ser. No. 427,156
Int. Cl. G01t *1/16*
U.S. Cl. 250—262 **7 Claims**

1. A nuclear well logging system comprising a logging tool adapted to be passed through a borehole in an earth formation, said logging tool includes detecting means responsive to penetration radiation in the borehole for providing data pulses corresponding in number and amplitude to the detected penetration radiation, means for detecting another condition in the borehole and providing a low frequency signal corresponding thereto; a transmission system including an armored multiconductor coaxial cable which comprises an inner conductor, a coaxial first insulator, groups of conductors arranged in a predetermined relationship to said inner conductor and separated from said inner conductor by said coaxial insulator, means for separating the conductor groups so as to insulate each conductor group from any other conductor group of the groups of conductors, a second coaxial insulator, and an outer armor of conductive material separated from said groups of

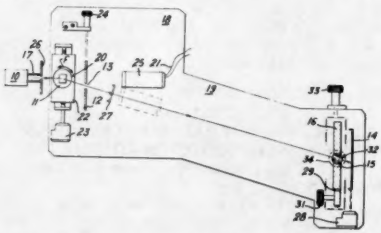
conductors by said second coaxial insulator; the logging tool also includes means connected to the sensing means, to the detecting means, and to the transmission system for applying the data pulses from the detecting means to the inner conductor and to the groups of conductors of the cable and for applying the signal from the sensing means to one conductor of the plurality of conductors and to the outer armor of the conductive material; and surface electronics adjacent to the borehole for processing the data pulses and the condition signal transmitted by the transmission system to provide outputs corresponding to the detected radiation and the sensed condition.



3,855,469
DEVICE FOR THE DISPLAY OF LOCAL DISORIENTATIONS IN SINGLE CRYSTALS

Max Pluchery, Grenoble, and Claude Roughon, Fontaine, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Continuation of Ser. No. 222,634, Feb. 1, 1972, abandoned. This application Aug. 29, 1973, Ser. No. 392,439
Claims priority, application France, Feb. 3, 1971, 71.03560
Int. Cl. G01n *23/22*
U.S. Cl. 250—272 **3 Claims**

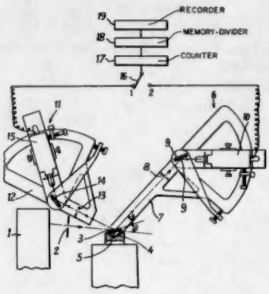


1. A device for the display of local disorientations in single crystals comprising a monochromatic X-radiation source, means for directing a beam of incident X-rays from said source onto the single crystal, means for detecting the intensity of the diffraction emergent X-ray beam from the crystal, means for displacing the single crystal, said X-ray source being seen from the single crystal at a substantial solid angle on the order of 1′ to 1° and said beam of incident X-ray being substantially divergent with an aperture angle of from 1′ to 1°, said means for displacing the single crystal including a rotatable goniometric clamp supporting the crystal, a carriage supporting said clamp, means for moving said clamp substantially at right angles to the direction of the incident X-ray beam, said means for detecting the intensity of the diffracted emergent beam including a stationary screen having a selecting slit downstream of the crystal for passage of said diffracted beam.

3,855,470
PROCESS AND APPARATUS FOR X-RAY CRYSTALLOGRAPHY

Jean Sahores, Buros, and Henri Ducasse, Lescar, both of France, assignors to Societe Nationale des Petroles d'Aquitaine, Paris, France

Filed Jan. 22, 1973, Ser. No. 325,353
Int. Cl. G01n *23/00*
U.S. Cl. 250—273 **9 Claims**

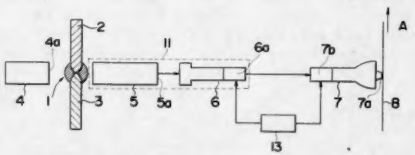


1. An x-ray crystallographic process comprising, measuring the intensity of the radiation (*Id*) diffracted by each constituent element of a sample, identified qualitatively by its angle of diffraction, measuring the intensity of the Compton radiation (*Ic*) scattered by the whole sample, and determining the content C of each element as the ratio of the intensity *Id* with respect to the intensity *Ic*.

3,855,471
RADIOGRAPH RECORDING APPARATUS

Yoshizo Ikegami, Amagasaki, Japan, assignor to Konan Camera Research Institute, Nishinomiya, Hyogo, Japan

Filed Apr. 20, 1973, Ser. No. 352,990
Int. Cl. G01n *21/34*
U.S. Cl. 250—320 **8 Claims**



1. A radiograph recording apparatus for obtaining a continuous series of radiographs produced on the surface of a photosensitive recording paper comprising:

an X-ray generator means for generating X-rays toward an object to be examined,

an image multiplier tube which produces an image on a fluorescent screen of said image multiplier tube in response to said X-rays received from said object,

a platform structure including an upper platform portion supporting said X-ray generator means and a lower platform portion supporting at least said image multiplier tube, said upper and lower platform portions being connected in said platform structure with a cross-section which is approximately rectangular, said object being placed between said upper and lower platform portions, wherein said platform structure includes wheels for providing relative movement between said object and said X-ray generator and image multiplier tube,

a television camera tube means being arranged in connection with the image multiplier tube in such a manner that said television camera tube means continuously scans a line on said fluorescent screen of said image multiplier tube, said line scan being in the direction perpendicular

to the direction of relative movement between said object and said X-ray generator and image multiplier tube,

an image reproducing means for converting a video signal from said television camera tube into image reproducing signals which scan linearly on a front plate of said image reproducing means, and

a photosensitive recording material which is moved in a direction parallel to the linear scan image reproducing signals of said image reproducing means.

3,855,472
DEVICE AND A PHOTOGRAPHIC FILM PACKAGE FOR USE IN AUTOMATIC RADIOGRAPHY

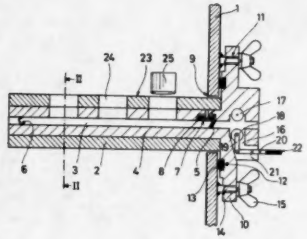
Jacques Robert Philippe Removille, Luxemburg, and Francois Schmit, Bascharage, both of Luxembourg, assignors to European Atomic Energy Community (Euratom), Luxemburg, Luxembourg

Filed Jan. 16, 1973, Ser. No. 324,175

Claims priority, application Luxembourg, Jan. 19, 1972, 64613

Int. Cl. G03b *41/16*

U.S. Cl. 250—321 **4 Claims**



1. A device for automatically radiographing radioactive or X-ray emitting samples inside a radiation shielding enclosure, said device comprising:

means for supporting a photographic plate including a plate holder having a passage therein, said passage being lined with a radiation shielding material and having a plate inlet and a plate outlet,

a seal disposed in said passage at said inlet,

plate retaining means disposed in said passage at said outlet, said holder having one or more recess means adjacent said passage between said inlet and outlet for holding said samples to be radiographed,

and means for securing said holder in a sealing-tight manner to the inner wall of said enclosure,

whereby when said device is in use said passage receives a photographic plate through said inlet and holds said plate between said inlet and outlet.

3,855,473
RADIOACTIVITY MEASURING DEVICE WITH A MOVABLE DETECTOR HEAD

John E. Burgess, Arlington Heights; Kenneth C. Dieball, Barrington, and Raymond F. Obrycki, Mt. Prospect, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 273,768, July 21, 1972, abandoned. This application June 4, 1973, Ser. No. 366,676

Int. Cl. G01t *7/02*

U.S. Cl. 250—328 **22 Claims**

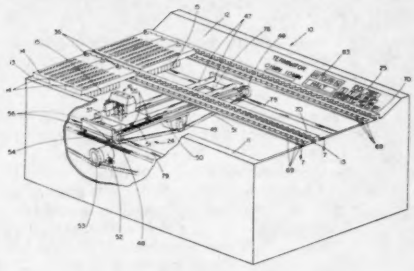
1. A radiation measuring device for measuring radioactivity of a multiplicity of discrete samples comprising:

a. a mounting frame,

b. sample bearing means supported by said mounting frame for positioning a multiplicity of discrete samples at predetermined intervals from each other in a lateral array with samples depending from said sample bearing means,

c. a detector head containing at least one photodetector that generates electrical pulses of energy proportional to the energy in scintillations received, protected by a shielding means that defines an aperture extending proximate to each photodetector,

d. translation inducing means coupled to said detector head for moving said detector head laterally beneath the aforesaid samples to traverse the aforesaid array of samples and for moving the detector head vertically alternately between a lowered position located beneath the aforesaid samples and a raised position with a substantial portion of at least one depending sample extending into one of the



aforesaid apertures in said shielding means proximate to a photodetector,

e. a scintillator sensitive to radioactive events located proximate to said photodetector and to samples extending into said apertures when said detector head is in the aforesaid raised position, and

f. pulse counting means connected to said photodetectors for receiving and tabulating pulses generated as a result of radioactive events occurring in the samples extending into said apertures in the shielding of said detector head.

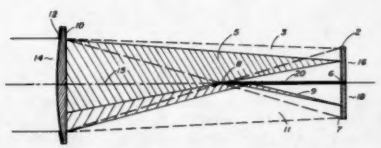
3,855,474
NON-SCANNING OBJECT POSITION INDICATING RADIOMETRIC DEVICE INDEPENDENT OF OBJECT IRRADIANCE VARIATIONS

Kenneth A. Ward, Greenwich, Conn., assignor to Barnes Engineering Company, Stamford, Conn.

Filed June 28, 1973, Ser. No. 374,718

Int. Cl. G01j *3/02*

U.S. Cl. 250—349 **6 Claims**



1. A non-scanning extended-source position-indicating device for determining the position of an edge of an extended source within a rectangular field of view which is independent of source irradiance and relatively independent of variation of radiation along the extended source comprising, in combination,

a. an objective lens having a rectangular aperture and a rectangular field of view,

b. radiation detector means optically positioned at the focal plane of said objective lens,

c. obstruction means for splitting the radiation from said rectangular field of view falling on said detector means, said obstruction means extending at the optical axis to a point at which a ray of radiation from the lower edge of the aperture crosses the optical axis in reaching the upper edge of said detector means.

3,855,475

UV-SPECTROGRAPHIC ANALYSIS OF BERYLLIUM AND CARBON FOR DETERMINING NUCLEAR REACTOR FUEL ELEMENT CONSUMPTION

Martin Demmeler, Grosshesselohe, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Dec. 18, 1972, Ser. No. 316,257

Claims priority, application Germany, Dec. 23, 1971, 2164098

Int. Cl. G03b *27/04*

U.S. Cl. 250—372 **2 Claims**

1. A spectral analytic method of determining the consumption of fuel elements for nuclear reactors, according to which the fuel is contained in a graphite covering, which includes in combination the steps of:

establishing an electric arc;

volatizing traces of the component parts of the surface of a fuel element in said electric arc;

splitting up the thus formed arc light;

scattering the characterizing lines of the graphite and of the beryllium formed during irradiation in said reactor; and

comparing the intensity proportions of at least one of the lines of said beryllium lying in the UV region and at least one of the lines of said graphite lying in the UV region.

3,855,476

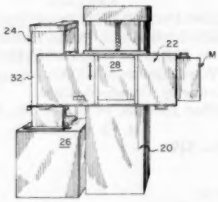
FILM TRANSFER DEVICE

Robert B. Farmer, Boulder, Colo., assignor to Katum Corporation, Boulder, Colo.

Filed Apr. 13, 1973, Ser. No. 350,891

Int. Cl. G01n *23/00*

U.S. Cl. 250—470 **9 Claims**



1. For use in combination with an x-ray unit having a vertically adjustable film exposure unit operable to discharge an exposed film from a film discharge slot at one side thereof throughout the entire range of vertically adjustable movement of the exposure unit, and a stationary film processing unit having an upwardly opening film receiving slot, a film transfer unit for transferring exposed film from the discharge slot of said exposure unit to the receiving slot of said processing unit comprising a vertically elongate housing having an opening at its lower end adapted to overlie said receiving slot, mounting means at the lower end of said housing for mounting said housing upon said processing unit with said film receiving slot encompassed by said opening, said housing having a vertically elongate slot in one side thereof extending along the entire range of movement of said discharge slot of said vertically adjustable exposure unit when said housing is mounted upon said processing unit, first light seal means on the exterior of said housing extending along opposite sides of said vertically elongate slot slidably engageable with said exposure unit on opposite sides of said discharge slot, second light seal means on the interior of said housing extending along opposite sides of said vertically elongate slot, an upper and a lower curtain section spanning said vertically elongate slot and slidably engaged along their opposite side edges by said second light seal means, and third light seal means for securing the lower end of said upper curtain section to said exposure unit above said discharge slot and for receiving the upper end of said lower curtain section to said exposure unit below said discharge slot, said third light seal means extending transversely across said first light seal means to slidably engage said first light seal means at opposite sides of said vertically elongate slot.

3,855,477

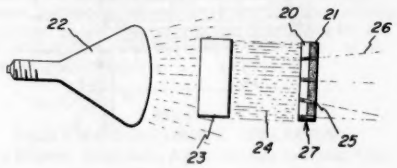
DETECTION AND MEASUREMENT OF RADIATION DAMAGE BY POLARIZED LIGHT

Robert L. Fleischer, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1971, Ser. No. 194,428

Int. Cl. G01t *5/10*

U.S. Cl. 250—473 **6 Claims**



1. A process for detecting and measuring radiation damage which comprises providing a sheet of dielectric polarizing material having a thickness of at least about 1 micron, exposing said dielectric polarizing sheet to radiation to produce tracks of radiation damaged material therein extending from one surface through the opposite surface thereof, contacting said sheet with an etchant to selectively dissolve and remove said tracks of damaged material to form holes therein passing from one surface through the opposite surface thereof, said holes in the resulting etched polarizing sheet not being visible to the unaided eye, irradiating unpolarized visible light on a side of a polarizer which polarizes the light by selective absorption to transmit visible light polarized in a single plane, irradiating said visible light polarized in a single plane on one side of said etched polarizing sheet, and while said visible polarized light is irradiated on one side of said etched polarizing sheet positioning said sheet until it substantially blocks transmission of said visible polarized light and appears substantially opaque in said polarized light resulting in passage of said visible polarized light only through said holes in said sheet, said visible polarized light emerging from said holes on the opposite side of said sheet indicating the presence of said holes.

3,855,478

Patent Not Issued For This Number

3,855,479

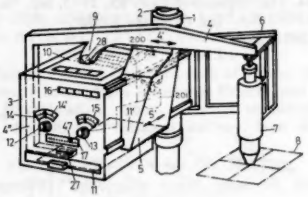
RAY DIAGNOSIS APPARATUS

Jobst V. Harsdorf, and Edgar Tschunt, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Continuation-in-part of Ser. No. 788,722, Jan. 3, 1969, abandoned. This application Apr. 12, 1971, Ser. No. 132,997

Int. Cl. G01t *1/20;* **A61b** *6/00*

U.S. Cl. 250—369 **3 Claims**



1. An apparatus for determining the distribution of radioactive substances in a body, comprising a radioactive substance measuring head, means for moving the measuring head for a line-wise scanning of said body, impulse producing means connected with said head, means for producing a synchronous movement of the measuring head and a light actuated writer for the distribution of radioactive substances, adjusting means for adjusting the impulse rate of *n* of the impulse producing means, adjusting means for adjusting the scanning speed v of the measuring head, a calculating means interconnecting the two adjusting means and providing the quotient *n*/*v*, a setting means for setting the flash duration of said writer connected with said interconnecting means and said writer for setting flash duration corresponding to the quotient *n*/*v*, and an electrical circuit means connecting said writer with said impulse producing means.

3,855,480

FAULT-INDICATING CIRCUIT FOR A FLOW-METERING SYSTEM

Gyorgy Striker, and Bela Gyurusi, both of Budapest, Hungary, assignors to Merestechnikai Kozponti Kutato Laboratorium, Budapest, Hungary

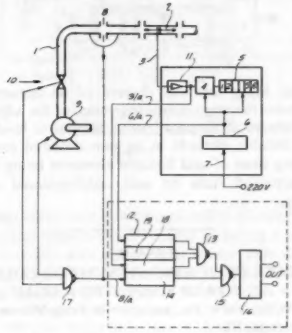
Continuation-in-part of Ser. No. 251,749, May 9, 1972, abandoned. This application Nov. 14, 1973, Ser. No. 415,805

Claims priority, application Hungary, May 21, 1971, ME 1362

Int. Cl. G01f *15/00*

U.S. Cl. 307—118 **3 Claims**

1. In a flow metering system comprised of a fluid conduit, means for establishing a flow of fluid through said conduit, means for generating an electrical flow velocity signal indicative of the velocity of fluid flow through said conduit, means for registering the value of said electrical flow velocity signal over a period of time in order to determine the quantity of fluid passing through said conduit during such period of time, a source of biasing voltage for said means for registering, and means for detecting the existence or non-existence of fluid flow in said conduit, in combination therewith, a fault-indicating circuit including a first transistor, means for applying to the base of said first transistor a voltage corresponding to said electrical flow velocity signal, a second transistor having a base connected to the collector of said first transistor, means for applying to the collectors of said transistors a biasing voltage corresponding to the output voltage of said source of biasing voltage, a third transistor having an emitter connected to the emitter of said first transistor, a parallel RC circuit comprised of the parallel connection of a resistor and a capacitor connected across the base-emitter junction of said third transistor, a first charging circuit branch connected



between the emitter of said second transistor and the base of said third transistor and operative for charging said capacitor with current flowing through the collector-emitter path of said second transistor, means including a second charging circuit branch connected to the base of said third transistor and connected to said means for determining the existence or non-existence of fluid flow and operative for charging said capacitor with current by applying to the input of said second charging circuit branch a predetermined voltage when said means for detecting the existence or nonexistence of fluid flow in said conduit detects the existence of fluid flow in said conduit, and warning means comprising a fourth transistor having a base-emitter junction connected across the collector-emitter path of said third transistor, an indicating lamp connected between the collectors of said second and fourth transistors, means connecting the base of said fourth transistor to the collector of said second transistor, and a relay connected across the collector-emitter path of said fourth transistor.

3,855,481

N-STATE LOGIC CIRCUIT

Archibald James DeMone, 515 Bernardo Ave., Apt. 10, Sunnyvale, Calif. 94086

Filed Apr. 9, 1973, Ser. No. 349,144

Int. Cl. H03k *23/08, 3/29*

U.S. Cl. 307—225 R **10 Claims**

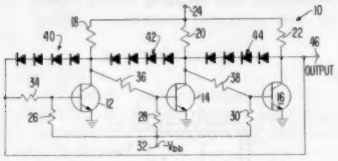
1. An electronic circuit for generating an output signal having N discrete levels each representative of a different stable state where N **3,** said circuit comprising:

N bistable elements each having first and second terminals adapted to be coupled to first and second reference voltage sources and a control input terminal adapted to be coupled to an actuating signal;

a plurality of unidirectional conducting devices for coupling together the first terminals of adjacent ones of said bista-

ble elements, one of said first terminals serving as an output terminal for manifesting said N level output signal; and

means for coupling said first terminal of individual ones of said bistable elements to the control input terminal of an adjacent one of said bistable elements so that actuation of one of said bistable elements by the application to the



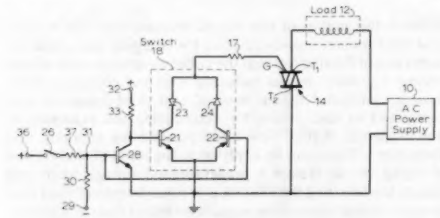
control input terminal thereof of an actuating signal maintains the control input terminal of the adjacent bistable element at a signal level sufficient to hold said adjacent bistable element in an non-actuated state, the remaining ones of said bistable elements being held in the non-actuated state by said unidirectional conducting devices.

3,855,482

SOLID STATE SWITCHING SYSTEM FOR COUPLING AN AC POWER SUPPLY TO A LOAD

Frank E. Wills, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 5, 1972, Ser. No. 285,960
Int. Cl. H03k *17/72*
U.S. Cl. 307—252 B **1 Claim**



1. A solid state switching system for controlling the application to a load of an alternating voltage provided by a two-terminal AC power supply, comprising:

a triac having first and second main terminals and a gate terminal;

means for connecting one of the power supply terminals through the load to said first main terminal and for connecting the other power supply terminal directly to said second main terminal;

a triggering circuit coupled between said gate terminal and said second main terminal and including a series-connected resistor and a series-connected electronic switch having a complementary pair of parallel-connected transistors, the emitters of which are joined together and connected directly to said second main terminal, and in which the collectors of said transistors are connected through respective ones of a pair of oppositely-poled diodes to one terminal of said resistor, the other terminal of said resistor being connected to said gate terminal;

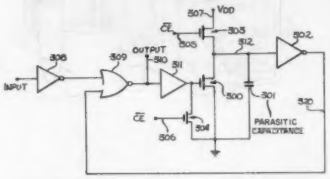
and control means for establishing and maintaining said transistors forward biased to permit conduction thereof in alternation in response to polarity changes of the alternating voltage in order to close said electronic switch and effect bidirectional current flow between said gate terminal and said second main terminal to trigger said triac into conduction at the beginning of each half cycle of the alternating voltage, thereby effectively applying that voltage continuously to the load via the conducting triac while at the same time deriving the bidirectional triggering current entirely from the AC power supply so that no loading is placed on said control means.

3,855,483

MEMORY SYSTEM INCORPORATING A MEMORY CELL AND TIMING MEANS ON A SINGLE SEMICONDUCTOR SUBSTRATE

Joel A. Karp, and William M. Regitz, both of Cupertino, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 225,829, Feb. 14, 1972, Pat. No. 3,778,784. This application Mar. 15, 1973, Ser. No. 341,565
Int. Cl. H03k *17/00*
U.S. Cl. 307—279 **5 Claims**



1. A timing circuit comprising:

a field effect transistor having at least two terminals and a gate;

capacitance means having one terminal coupled to one terminal of said transistor;

charging means for selectively charging said capacitor means coupled to said capacitor means;

logic circuit means for providing a logic output signal upon predetermined conditions;

Schmitt trigger means having its input coupled to said one terminal of said capacitor and said one terminal of said transistor, and its output coupled to said logic circuit means;

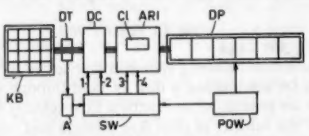
whereby the output of said Schmitt trigger shall be a function of the rate at which said capacitor means discharges.

3,855,484

ELECTRONIC CIRCUIT ARRANGEMENT

Hendrik Arie Van Essen; Arie Slob, and Johannes Paulus Lambertus Lagerberg, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1973, Ser. No. 340,958
Claims priority, application Netherlands, Mar. 25, 1972, 7204035
Int. Cl. H03k *17/00*
U.S. Cl. 307—296 **2 Claims**



1. An integrated circuit arrangement for processing an information signal at a reduced power consumption comprising:

a power supply; an injection logic circuit including logic gates, a clock for controlling the speed of operation of the gates, and connections for current sources for current injectors of the circuit;

means for detecting signal transitions at the input of the circuit to provide a first control signal in response to the occurrence of the information signal and, respectively, a second control signal in response to the termination of the information signal at the input of the circuit; and

control means connected between said power supply and said connections and controlled by said detecting means for setting the current of the current sources to a higher value in response to said first control signal and to a lower value in response to said second control signal, whereby the clock varies its frequency proportionally to the current value.

3,855,485
GROUND COIL ASSEMBLY OF A LINEAR INDUCTION MOTOR WITH D.C. LEVITATING ARMATURE FOR HIGH SPEED VEHICLE

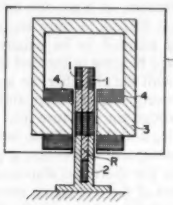
Kazumi Matsui; Takashi Umemori, both of Tokyo; Masahiko Toyoshima, Hitachi; Kozo Katakami, Hitachi, and Susumu Osawa, Hitachi, all of Japan, assignors to Hitachi Cable Limited and Japanese National Railway, both of Tokyo, Japan

Filed June 11, 1973, Ser. No. 368,929

Claims priority, application Japan, June 10, 1972, 47-57347; July 28, 1972, 47-75034

Int. Cl. H02k *41/02*

U.S. Cl. 310—13 **3 Claims**



1. In a ground coil assembly of a D. C. linear motor for a high speed vehicle, wherein said linear motor is of the type wherein the vehicle has movable magnetic fields disposed such that the magnetic flux generated is perpendicular to the current loop of the fixed armature windings of the ground coil assembly and cuts across vertical and horizontal conductors of the fixed armature windings, and wherein the fixed armature windings consist of rectangular current loops having vertical and horizontal conductors, aligned continuously along the path of travel of the moving vehicle, and a relative lift is developed between the horizontal conductors of the fixed armature windings and the movable magnetic field and at the same time a relative drive is developed between the vertical conductors of the fixed armature windings and the moving magnetic field to thereby cause the vehicle to be suspended and propelled along the path, the improvement wherein:

the fixed armature windings of the ground coil assembly comprises a coil which includes a multiplicity of coil elements of at least two electrical phases arranged with a conductor for respective phases of $2\pi/n$ relative to each other, and said ground coil assembly further comprises a fixed induction coil which includes a multiplicity of coil elements of the same winding pitch as that of the coil elements of the fixed armature coil, with the coil elements of the fixed induction coil having a conductor pitch of $2\pi/2n$, wherein n is the number of phases of said armature coil.

3,855,486
STEP MOTOR

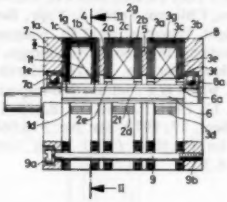
Wilhelm Binder; Rudolf Hauer, both of Villingen, and Edmund Bausch, Kirchen-Hausen, all of Germany, assignors to Binder Magrete GmbH, Villingen, Germany

Filed Oct. 11, 1973, Ser. No. 405,645

Claims priority, application Germany, Oct. 11, 1972, 2249729

Int. Cl. H02k *37/00*

U.S. Cl. 310—49 **19 Claims**



1. In a step motor comprising a plurality of axially serially positioned stator systems, said systems including a stator coil extending coaxially with a rotor axis, stator pole discs positioned at opposite sides of said stator coil, said stator pole discs having radially extending pole pieces, and a yoke interconnecting said stator pole discs; a rotor having pole pieces associated with said stator pole pieces, said rotor being rotatably supported at both ends thereof on stator bearing discs encompassing the ends of said stator systems, the improvement comprising; said yoke intermediate said stator pole discs being a pair of half shells extending coaxially with the rotor axis and being formed of concentric half shell-sheet metal laminae, two said stator pole discs, said half shell-shaped yoke and a ring-shaped stator coil constituting one said stator system; and discs of a non-magnetic material being interposed between adjacent of said detachably interconnected stator systems, said discs forming spacer and centering means for said stator systems.

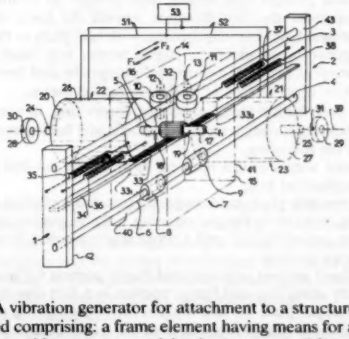
3,855,487
VIBRATION GENERATOR FOR STUDYING STRUCTURES

Jean-Francois Boisseau, Paris, France, assignor to Office National D'Etudes Et De Recherches Aerospatiales (par abreviation D.N.E.R.A.), Chatillon-sous-Bagneux, France

Filed Feb. 12, 1973, Ser. No. 331,487

Int. Cl. H02k *7/06*

U.S. Cl. 310—80 **19 Claims**



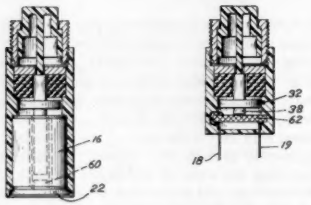
1. A vibration generator for attachment to a structure to be studied comprising: a frame element having means for attachment to said structure, a weighted mass mounted for rectilin-

ear reciprocation upon said frame element, rotary motor means capable of rotation in either of two opposite rotational directions having a motion output shaft carried by said frame element, and means interconnecting said motion output shaft and said mass whereby rotational motion of said motor is converted to linear motion of said mass, and cyclic operation of said motor results in the impartation of a vibration to said frame.

3,855,488
PUSH BUTTON PULSE SIGNAL GENERATOR

Leon R. Britton, Chicago; Frank S. Vojir, Berwyn, and William W. Wright, Wheaton, all of Ill., assignors to Guardian Electric Manufacturing Company, Chicago, Ill.

Continuation of Ser. No. 240,161, March 31, 1972, abandoned, which is a continuation-in-part of Ser. No. 170,729, Aug. 11, 1971, Pat. No. 3,718,828. This application Sept. 17, 1973, Ser. No. 398,065
Int. Cl. H04r *17/00*; **H03k** *3/00*
U.S. Cl. 310—8.3 **2 Claims**



1. A push button signal generator comprising, in combination:

a housing having a longitudinal axis and having mounted therein the following:

a. a piezoelectric plate mounted in one end of said housing, said plate having signal leads;

b. A movable plunger of magnetic material including an extension at one end engageable with said plate, said plunger also including an intermediate flange portion and a projection at the other end;

c. A fixed magnet adjacent said flange portion for magnetically attracting said plunger in a first direction to a first position not engaging said plate;

d. a keeper plate for engaging said projection to limit the travel of said plunger in said first direction and prevent said flange from engaging said magnet; and

e. push button means including an extension for engaging said plunger and driving said plunger in a direction opposite the first direction against the force of said magnet and into engagement with said plate to thereby generate an electrical signal across said leads, said magnet acting to return said plunger to said first position upon release of said push button means.

2. A push button signal generator comprising, in combination a housing having a longitudinal axis and having mounted therein the following:

a. a coil with a center opening substantially parallel to the longitudinal axis;

b. a movable plunger of magnetic material including a portion movable in the coil opening, a flange portion outside one end of the coil and a projection extending from said flange portion;

c. a fixed magnet adjacent said flange portion for magnetically attracting said flange portion in a first direction;

d. a keeper plate on said magnet for engaging said projection from said plunger to limit the travel of said plunger in said first direction;

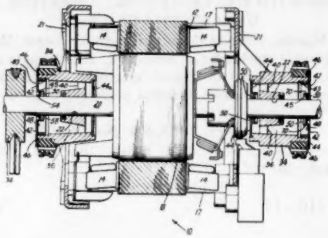
e. push button means including means for engaging said plunger and driving said plunger from said keeper plate in a direction opposite the first direction; and

f. magnetically conductive material positioned on the opposite end of said coil opposite said plunger and extending at least partially into said coil.

3,855,489
DYNAMOELECTRIC MACHINE HAVING IMPROVED LINT GUARD MEANS

Doran D. Hershberger, Sycamore, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed May 14, 1973, Ser. No. 360,046
Int. Cl. H02k *5/10*
U.S. Cl. 310—85 **13 Claims**



1. A dynamoelectric machine adapted for operation in an atmosphere having foreign particles therein comprising a stator with a bore therein, at least one end frame having a chamber for lubricant therein, a rotor mounted for rotation within the bore and adapted to be axially movable within predetermined limits, a bearing in the end frame for lubricating communication with the chamber, an aperture in the end frame connected between the chamber and the atmosphere, a shaft extending through the aperture into the chamber and received by the bearing and the shaft also being secured to the rotor for conjoint movement therewith, a generally annular lint guard secured to the shaft and disposed in close spaced relation with a portion of the end frame about the aperture, a narrow generally annular gap between the lint guard and the portion of the end frame about the aperture for preventing entry into the chamber of foreign particles which may accumulate along the shaft adjacent the aperture, and at least one of the end frame portion and the lint guard being generally axially overlapping wiith the other thereof a distance at least great enough to accommodate the axial movement of the rotor.

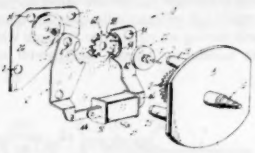
3,855,490
SYNCHRONOUS MOTOR WITH FLUX CONDUCTOR

Philip A. Sidell, West Hartford, Conn., assignor to McGraw-Edison Company, Elgin, Ill.

Continuation of Ser. No. 175,664, Aug. 27, 1971,. This application Feb. 28, 1973, Ser. No. 336,837
Int. Cl. H02k *21/18*
U.S. Cl. 310—162 **10 Claims**

1. A synchronous motor comprising a stator including a field portion and a coil portion disposed about the field portion, the field portion including a pair of spaced flux conducting stator pole projections having a gap therebetween, the coil portion being energizable from an alternating current source to produce instantaneous opposite polarity between the stator pole projections, an annular ceramic permanent magnet rotor supported for rotation about an axis perpendicular to a plane extending between the stator pole projections and with peripheral edge portions of the rotor adjacent the stator pole projections, individual permanent magnetic poles being formed about the periphery of the annular ceramic permanent magnet rotor and circumferentially disposed about the periph-

ery of the rotor in fixed relation to the rotor with adjacent permanent magnetic poles being of opposite polarity, and a flux conductor member fixed in the gap and extending in



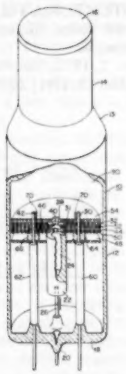
magnetic series relation between at least one pair of permanent magnetic poles of opposite polarity and in series with the stator pole projections.

3,855,491

HOLLOW CATHODE DISCHARGE LAMP FOR GENERATING RADIATION CHARACTERISTIC OF THE GAS FILL WITHIN THE ENVELOPE

George K. Yamasaki, Horseheads, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 28, 1970, Ser. No. 58,790
Int. Cl. H01j *61/06*
U.S. Cl. 313—193 **1 Claim**



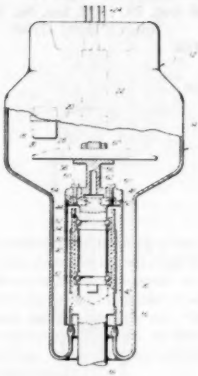
1. A hollow cathode light source comprising an envelope, said envelope including an anode and a cathode disposed in spaced relationship for maintaining an electron discharge therebetween, said cathode having a hollow portion therein and made of a material having the property of establishing an electron discharge between said cathode and said anode, a baffle electrode positioned between said cathode and said anode and having an aperture therein of a smaller diameter than the aperture in said hollow cathode, said envelope containing hydrogen gas which is ionizable, and radiation characteristic of the hydrogen is generated and passed through the aperture in said baffle electrode in response to an electron discharge between said cathode and anode, the aperture in said baffle electrode being substantially smaller than the aperture in said cathode to restrict the passage of light generated within said hollow portion due to material of said cathode.

3,855,492

VIBRATION REDUCED X-RAY ANODE

Helmut Langer, Springdale, and Vincent Sollima, Stamford, both of Conn., assignors to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed Nov. 19, 1973, Ser. No. 417,464
Int. Cl. H01j *35/10*
U.S. Cl. 313—60 **5 Claims**



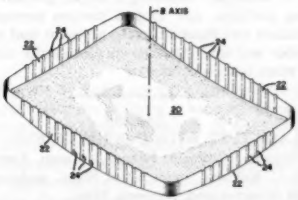
1. An x-ray tube comprising an envelope containing a rigid anode supporting structure, a rotor structur rotatably mounted on said supporting structure, and an anode structure having a portion engaging and secured to a portion of said rotor structure for rotation therewith, said portion of said anode structure being titanium-zirconium-molybdenum alloy containing about 99.5% molybdenum, and the engaged portion of the rotor structure being of material in the Fe-Ni-Co family.

3,855,493

SHADOW MASK AND PROCESS FOR MANUFACTURE

Ernest R. Snook, East Syracuse, and William H. Nicklas, North Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Continuation-in-part of Ser. No. 302,071, Oct. 30, 1972, abandoned. This application Oct. 12, 1973, Ser. No. 405,845
Int. Cl. H01j *29/06*
U.S. Cl. 313—402 **8 Claims**



1. A shadow mask adapted to be mounted within a color television picture tube having a plurality of electron guns therein such that a Z axis extending between the center of the electron guns and the center of said mask is oriented normal to the plane of the incremental area of said mask where said axis intersects said mask, said mask comprising:

a dome-shaped face;

a skirt extending from the periphery of the dome-shaped face substantially parallel to said Z axis; and

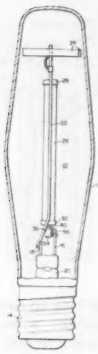
a plurality of ribs formed in said skirt, each of said ribs extending longitudinally along the general direction of the Z axis and extending away from said skirt by no more than 0.025 inch.

3,855,494

CERAMIC ARC LAMP CONSTRUCTION

Vernon L. Plagge, East Orange, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1973, Ser. No. 392,692
Int. Cl. H01j *17/04*
U.S. Cl. 313—184 **4 Claims**



1. An arc discharge lamp of the ceramic arc tube type comprising;

a base,

an outer envelope sealed to said base,

a pair of lead-in conductors electrically connected to said base and extending into said outer envelope,

an arc tube mounting frame mounted within said outer envelope on one of said lead-in conductors and electrically connected thereto,

a ceramic arc tube having refractory metal end closure members closing off the ends thereof and refractory metal exhaust and fill tubulation extending from at least one end closure member, said ceramic arc tube supported at its upper end on said mounting frame, and

a refractory metal looped lead-in connector, said looped lead-in connector including a looped portion and a pair of leg portions, said looped portion surrounding said tubulation and brazed thereto adjacent said end closure member and said leg portions electrically connected to said other lead-in conductor.

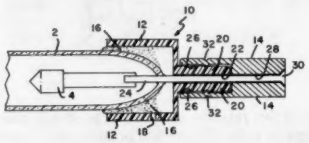
3,855,495

FLASH TUBE WITH INSULATOR END CAP

John A. Pappas, Winthrop; Robert J. Cosco, Amesbury, and Charles C. Kokinos, Lynn, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 5, 1973, Ser. No. 412,814
Int. Cl. H01j *5/56*
U.S. Cl. 313—318 **6 Claims**

1. An injection-triggered flash tube comprising: an elongated, light-transmitting envelope which is hermetically sealed; a rare gas in said envelope; a pair of electrodes in said envelope, one disposed at each end thereof; a respective lead-in conductor sealed through each end of said envelope and connected to the electrode thereat; and an end cap at each end of said envelope, each of said end caps having a shoulder portion comprising a substantially tubular piece of insulating material coaxially disposed about and secured to the exterior of a respective end of said envelope, and an exterior terminal portion comprising a substantially tubular metal conductor secured to and coaxially projecting from said insulating shoulder, the piece of insulating material from which said shoulder is formed further including a coaxially extending tubular portion of substantially smaller diameter than said shoulder and having an axial bore through which said respective lead-in conductor passes, said metal terminal portion



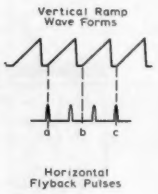
containing a cylindrical cavity within which the extended tubular portion of said insulating material is fitted and secured, and said terminal portion having an axial bore aligned with the bore in the extended tubular portion of said insulating material and through which said respective lead-in conductor passes and is electrically secured to said metal terminal portion, whereby said terminal portion is electrically connected to the electrode disposed within said respective end of the envelope.

3,855,496

ANTI-PAIRING SYSTEM FOR A TELEVISION RECEIVER

Walter S. Ciciora, Park Ridge, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 7, 1972, Ser. No. 304,431
Int. Cl. H01j *29/70*
U.S. Cl. 315—393 **15 Claims**



1. A method for improving interlace between the horizontal scan lines of the two alternate raster fields of a television receiver in which vertical and horizontal deflection systems control the scan of an electron beam on a cathode-ray tube and in which a horizontal flyback pulse is generated during the horizontal retrace period, comprising:

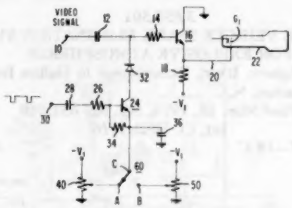
generating a train of vertical ramp waveforms to be applied to the vertical deflection system of the television receiver for causing the electron beam to be vertically deflected in synchronism with a received television signal; and

delaying the start of the vertical ramp waveforms with respect to the horizontal flyback pulses by a predetermined interval effective to insure that the beginnings of the vertical ramp waveforms for either field are not overlapped by a horizontal flyback pulse, whereby any components of the horizontal flyback pulse which are induced into a vertical ramp waveform occur at a time when their inclusion does not cause the lines of one field to pair with the lines of the alternate field.

3,855,497
DUAL BIAS CONTROLLED STORAGE TUBES

Denis Peter Dorsey, Levittown, Pa., and William E. Rodda, Trenton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 1, 1973, Ser. No. 337,012
Claims priority, application Great Britain, Apr. 24, 1972, 19020/72
Int. Cl. H01j *29/70*
U.S. Cl. 315—30 **5 Claims**



1. In a television image transmission system of the type wherein a single storage tube having an electron beam scanning a target is employed both for the selection of a particular frame of television information for transmission to a remote receiver location by an audio communications link and for the reception and re-creation of frame information so transmitted, and further of the type wherein image representative television information video or pulse signals are applied to the control grid of said storage tube for the selection or re-creation of said information dependent upon whether said tube is operating in the transmitting or in the receiving mode, the combination therewith of:

first and second sources of operating potential;

means for applying a bias voltage to the control grid of said storage tube; and

control means for coupling said first source of operating potential into circuit connection with said aforementioned means to bias the control grid of said tube to a direct current level to unblank the unmodulated scanning beam thereof when said storage tube is employed to select a particular television frame for transmission, thereby enabling said video signals to modulate said beam to develop a charge pattern on said target for transmission to said remote receiver location, and for coupling said second source of operating potential into circuit connection with said aforementioned means to bias the control grid of said tube to a different direct current level to blank the unmodulated scanning beam thereof when said storage tube is employed to re-create a television frame received along said audio communications link, thereby enabling amplitude modulations of said pulse signals to drive said tube into its operating region for re-creation of the pulse informations received;

with said control means being actuated for the coupling of said first or said second sources of operating potential depending upon whether said storage tube is to operate in its transmitting or receiving mode, respectively.

3,855,498
CENTER-POLE MAGNETIC CIRCUIT

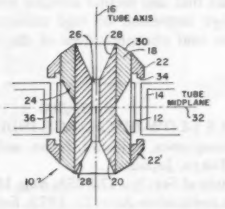
George H. MacMaster, Lexington, and Kenneth W. Dudley, Sudbury, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 1, 1973, Ser. No. 411,617
Int. Cl. H01j *25/50*
U.S. Cl. 315—39.71 **10 Claims**

1. A magnet comprising:

a middle section formed in a cylindrical shape with an inwardly tapered central portion, said middle section being formed from a material which is permanently magnetized and is radially gaussed;

an inner section formed in a cylindrical shape and placed radially inward of and abutting said middle section, said inner section being fabricated from a high-magnetic-

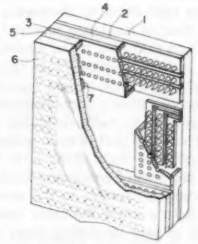


permeability material and forming a flux return path; and an outer section comprising two rings fabricated from a high-magnetic-permeability material, each ring comprising a pole piece, said rings being placed abutting the outer surface of said middle section, one ring near the top thereof and one near the bottom, so that said pole pieces face each other and a substantially uniform magnetic field extends therebetween.

3,855,499
COLOR DISPLAY DEVICE

Yahiko Yamada, Kodaira; Hiroshi Okano, Kokubunji, and Mikiya Yamane, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1973, Ser. No. 335,755
Claims priority, application Japan, Feb. 25, 1972, 47-18950
Int. Cl. H05b *37/02*
U.S. Cl. 315—169 R **4 Claims**



1. A color display device comprising an insulating substrate, a transparent insulator defining a vacuum space along with said substrate, a plurality of groups of field emission type electron sources formed in respective patterns on said substrate and serving as cathodes, a plurality of groups of phosphor dots applied on the surface of said transparent insulator on the inside of said vacuum space in positions to oppose said electron sources and having predetermined colors of light emission, means to commonly connect said electron sources of each group into a number of constituent elements forming patterns of identical configuration equal to the number of colors of phosphor dots so that those of said phosphor dots opposing each group of electron sources and which have the same color of light emission oppose one constituent element of said group of electron sources forming a respective pattern, anodes arranged respectively between each opposing group of phosphor dots and electron sources in order to draw out electrons from the commonly connected cathodes by field

emission, apertures provided in said anodes in a manner to oppose said electron sources, a transparent electrode provided between said transparent insulator and said phosphor dots, first selector means to selectively connect said commonly connected cathodes to energizing potential, and second selector means to selectively connect said anodes to energizing potential, whereby said electrons drawn out from said cathodes by voltages applied between said cathodes and anodes by said first and second selector means are accelerated by a voltage impressed on said transparent electrode and impinge on said phosphor dots of the same color of light emission.

3,855,500

GASEOUS GLOW-DISCHARGE INDICATOR SYSTEM

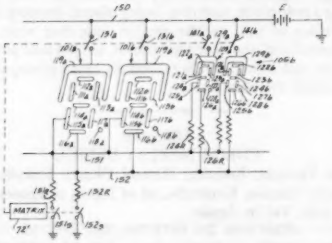
Yuzuru Yanagisawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 172,855, Aug. 18, 1971, abandoned. This application June 27, 1973, Ser. No. 374,133

Claims priority, application Japan, Sept. 1, 1970, 45-87014; Apr. 26, 1971, 46-27396

Int. Cl. H01j *61/66;* **H05b** *41/38*

U.S. Cl. 315—169 TV **9 Claims**



1. A gaseous glow indicator tube comprising a base plate of insulating material, a transparent cap sealed to said base plate and forming a gas tight chamber therewith, an ionizing gas in said chamber, a sheet of insulating material within said chamber and disposed on said base plate, a plurality of main similarly segmented indicator units within said chamber on the outer face of said sheet, each of said segmented units including a like number of cathode segments similarly located in a predetermined pattern in each indicator unit, at least one anode segment forming a part of each indicator unit and each located on said insulated sheet in the same plane as said cathode segments, a plurality of energizing leads on said insulating sheet corresponding in number to the maximum number of cathode segments in a single indicator unit, secondary leads on the underside of said insulating sheet connected respectively to said cathode energizing leads; means connecting said secondary leads to said cathode segments through said insulating sheet, at least one anode energizing lead for each indicator unit, a secondary lead for each indicator unit connecting the anodes of each indicator unit to an anode energizing lead respectively, a secondary indicator unit in said chamber including at least one cathode segment and one anode segment disposed on said insulating sheet, each cathode segment of said secondary indicator unit being smaller in area than the area of any one of said cathode segments of said main indicator units, an energizing lead for each cathode segment of said secondary indicator unit located on said outer face of said insulating sheet, circuit connections between each of said cathode energizing leads of said secondary indicator unit and associated cathode segment, energizing leads for said anodes of said secondary indicator units connected to their associated anodes respectively, and means for connecting successively said anode energizing circuits to a positive source of potential on a time sharing basis and simultaneously connecting selected ones of said cathode segments of each indicator unit to the negative side of the same source of potential on the same time sharing basis, thereby to cause selected segments of each indicator unit to glow and in which there is provided a resistor element in each cathode segment energizing circuit of said secondary indicator unit, thereby to reduce the current density in each such cathode segment when energized, the resistive value of each resistance element being sufficient to reduce the glow of its associated cathode segment only to a point where the cathode segment is still brighter than the cathode segments of said main indicator units.

3,855,501

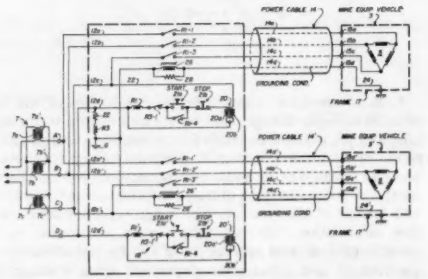
MULTIPLE VEHICLE SPARK ELIMINATION SYSTEM FOR EXPLOSIVE ATMOSPHERES

Thomas I. Agnew, Irwin, Pa., assignor to Gulton Industries, Inc., Metuchen, N.J.

Filed Mar. 15, 1974, Ser. No. 451,518

Int. Cl. H02h *3/16*

U.S. Cl. 317—18 C **4 Claims**



1. In a power system which delivers electrical power from a main source of power to at least two separately movable vehicles in an explosive atmosphere, each vehicle including a conductive frame and electrically operated equipment, the electrically operated equipment on each vehicle having at least one pair of energizing input terminals, a separate power cable for each vehicle extending between said vehicle and said main source of power, each cable having at least one pair of power conductors coupled to said energizing input terminals of the electrically operated equipment on the associated vehicle and a grounding conductor connected to the frame of the associated vehicle, the electrical field developed by the flow of current through said power conductors in each of said cables inducing an unbalanced voltage in the associated grounding conductor so there is the possibility of an induced voltage difference in the grounding conductors of a pair of said cables which can reach a given maximum value, interrupter contact means connected between said main source of power and at least one of said power cable conductors, and vehicle frame hazard protection means for operating said interrupter contact means to terminate the flow of power from said main source of power to the electrical equipment of the associated vehicle when at least one of said power conductors of each cable becomes electrically shorted to the associated grounding conductor or vehicle frame, the improvement comprising arc-preventing means for preventing the development of an arc in said explosive atmosphere when the frames of two of said vehicles come into contact with one another due to an unbalanced voltage or voltages induced in the grounding conductor of one or more of said cables, said arc-preventing means comprising saturable core reactor means in series with said grounding conductors which saturable core reactor means being unsaturated to present a high impedance to current flow under modest applied voltage conditions reaching said given magnitude and being saturated to present a negligible impedance to current flow under the voltage conditions when any of said cable power conductors becomes

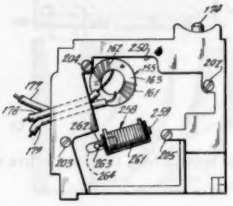
shorted to the associated cable grounding conductor or vehicle frame.

3,855,502

GROUND FAULT INTERRUPTER DEVICE

Von G. Pardue, Lawrenceville, Ga., and John B. Cataido, Moorestown, N.J., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Feb. 22, 1973, Ser. No. 334,840
Int. Cl. H02h *1/02*
U.S. Cl. 317—18 D **3 Claims**



1. Electrical protective equipment including housing means defining first and second compartments; a circuit breaker within said first compartment including a set of cooperating contacts, an operating means connected to said set of contacts and including an operating handle extending outside of said housing means and a latchable member, latch means for maintaining said member in latched position wherein said operating means through manual operation of said handle is effective to open and close said set of contacts, first pivot means mounting said latch means, overload sensing means for automatically moving said latch means about said first pivot means to release said latch means upon the occurrence of predetermined overload conditions; fault sensing means within said second compartment including a fault detecting means and an electromagnet that is energized by said fault detecting means upon the occurrence of predetermined fault conditions; said electromagnet including a relatively stationary magnetic yoke and an armature movable relative to said yoke; means extending between said compartments and operated by said armature upon attraction thereof by said yoke to move said latch means and thereby release said latchable member, whereby said operating means opens said set of contacts; said armature being mounted for movement along its axis and the means extending between said compartments projecting radially from the axis of said armature; said housing means including first and second housing modules defining the respective first and second compartments; said housing modules being generally of equal width and being secured together in adjacent side-by-side relationship; said first housing module having a first sidewall adjacent said second housing module; said first sidewall having an elongated slot extending parallel to the axis of the armature; said means extending between said compartments projecting through said elongated slot with movement of the former being guided by the latter.

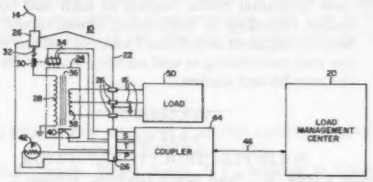
3,855,503

REMOTELY MONITORED AND CONTROLLED TRANSFORMER

Donald J. Ristuccia, Athens, Ga., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 26, 1973, Ser. No. 401,097
Int. Cl. H02h *3/28*
U.S. Cl. 317—27 R **10 Claims**

1. Electrical apparatus comprising:
an enclosure;
a core and coil assembly disposed within said enclosure;
temperature sensing means which electrically responds to the temperature of said core and coil assembly to provide a temperature signal which is detectable outside said enclosure;



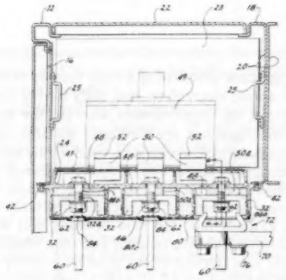
pressure sensing means which electrically responds to the pressure within said enclosure to provide a pressure signal which is detectable outside said enclosure; and
switching means for disconnecting the coil from an energizing voltage, said switching means being responsive to an electrical switching signal which is originated from outside said enclosure.

3,855,504

SWITCHBOARD WITH IMPROVED HORIZONTAL BUSBAR MOUNTING PROVISIONS

William Francis Olashaw, Plainville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Sept. 27, 1973, Ser. No. 401,245
Int. Cl. H02b *1/20*
U.S. Cl. 317—120 **10 Claims**



1. An electrical switchboard consisting of at least two side-by-side switchboard sections for distributing polyphase electrical power to a plurality of loads via respective electrical devices accommodated in compartments stacked vertically in each switchboard section, said switchboard comprising, in combination:

A. a frame;
B. a plurality of vertical busbars in each switchboard section, one for each phase;
C. means insulatively mounting said vertical busbars to said frame;
D. connectors electrically connecting said vertical busbars to the electrical devices and the electrical devices to their respective loads;
E. a plurality of horizontal busbars, one for each phase, each said horizontal busbar being made up of several horizontal busbar sections; and
F. common means at each crossing location in each switchboard section of correspondingly phased horizontal and vertical busbars

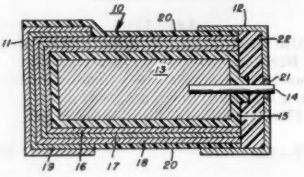
1. serially joining two of said horizontal busbar sections end-to-end,
2. mounting said horizontal busbars respectively to said vertical busbars, and
3. electrically connecting said horizontal busbars respectively to said vertical busbars; and

G. one horizontal busbar section of each said horizontal busbar extending in continuous, uninterrupted fashion between adjacent switchboard sections and having opposite ends terminating at said crossing locations in each of the switchboard sections.

3,855,505
SOLID ELECTROLYTE CAPACITOR

Steven Karlik, Jr., Palm Beach Gardens; William J. Hyland, Riviera Beach; Edward A. Souza, North Palm Beach, and Ernest D. Ganz, Palm Beach Gardens, all of Fla., assignors to National Components Industries, Inc., West Palm Beach, Fla.

Filed Apr. 3, 1972, Ser. No. 240,454
Int. Cl. H01g *9/05*
U.S. Cl. 317—230 **5 Claims**



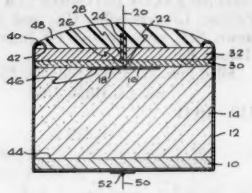
1. In a capacitor comprising a body formed of a valve metal anode and a solid electrolyte, said body having a stem extending therefrom; the improvement wherein the terminal electrodes of the capacitor are U-shaped metallic caps, wherein the negative polarity end cap is secured to one end of the body by an electrically-conductive adhesive, wherein the positive polarity end cap has an opening formed therein and includes a portion spaced from the other end of the body, wherein the said stem extends into the said opening and is electrically connected to the positive polarity end cap, wherein the space between the said portion of the positive polarity end cap and the end of the body is filled with a high temperature, non-conducting material, and wherein the said body is coated with a high temperature non-conducting coating which is intimately bonded thereto.

3,855,506
SOLID ELECTROLYTE COULOMETER

Andrew Halasz, Laval, Quebec; John D. Childs, Dorval, Quebec, and George H. Fraser, Saint Laurent, Quebec, all of Canada, assignors to Unican Security Systems, Ltd., Montreal, Quebec, Canada

Filed Jan. 26, 1973, Ser. No. 326,976
Int. Cl. H01g *9/05*
U.S. Cl. 317—230 **29 Claims**

1. An electrochemical timer device comprising a container, an assembly of a pair of electrodes of opposite polarity and a solid electrolyte disposed between said electrodes, said assembly positioned within said container, the upper edge portion of said container being crimped inwardly, with the crimped upper edge of said container in operative engagement with said assembly and compressing said electrodes and solid electrolyte together with a substantial pressure, said electrodes and said solid electrolyte maintained in substantially complete uniform interfacial contact, the materials of said electrodes

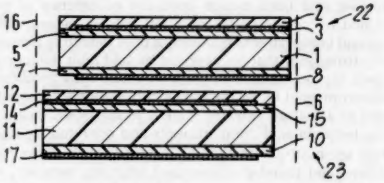


and said electrolyte approaching their respective theoretical densities.

3,855,507
SELF HEATING CAPACITORS

Gerhard Hoyler, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 4, 1973, Ser. No. 366,556
Claims priority, application Germany, June 7, 1972, 2227751
Int. Cl. H01g *3/15*
U.S. Cl. 317—258 **1 Claim**



1. A capacitor comprising a dielectric layer consisting of at least one thin film of insulating material from the group consisting of silicone resins and varnishes and capacitor electrodes located respectively on either side of said dielectric layer each of said electrodes being formed of metallic layers of zinc or aluminum having a thickness of not more than .1 microns said metallic layers located on opposite sides of a carrier of polyamide film, the metal layers serving as the first electrode being end contacted by a metal layer and extending to a first end of the capacitor, but not to the second end, the metal layers serving a the second electrode being end contacted by a metal layer and extending to the second end of the capacitor, but not to the first end, said polyamide film serving as a support for the capacitor having a higher modulus of elasticity than the dielectric layer and being located outside the electrical field of the capacitor and covering and contacting each major side of said polyamide film an intermediate film said intermediate film being the same material as said dielectric layer.

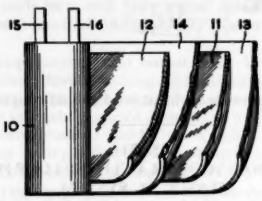
3,855,508
ELECTRICAL CAPACITORS HAVING SUBSTITUTED ESTER IMPREGNANTS

Sidney D. Ross, Williamstown, and Manuel Finkelstein, North Adams, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 195,856, Nov. 4, 1971, Pat. No. 3,740,625. This application June 13, 1973, Ser. No. 369,677The portion of the term of this patent subsequent to June 19, 1990, has been disclaimed.

Int. Cl. H01g *3/21*

U.S. Cl. 317—259 **8 Claims**



1. An electrical capacitor comprising a capacitance section having at least a pair of electrodes with a dielectric spacer between said electrodes, said section being impregnated with a liquid dielectric comprising at least one ester having a substituent on a position selected from the group consisting of a) on the acid side, only alkyl chains substituted on the carbon atom α to the ester carbonyl group; and b) on the alcohol side, alkyl chains substituted on at least two positions on the carbon atom β to the ester ether linkage.

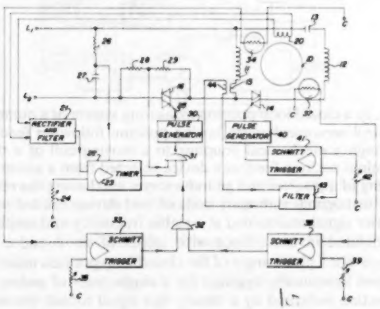
3,855,509
CONTROL SYSTEM FOR INDUCTION MOTORS

Floyd H. Wright, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 245,146, April 18, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,282

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 **22 Claims**



1. A control system for an induction motor having a main winding and an auxiliary winding adapted for excitation by an alternating-current source, the system comprising:

measuring means incorporated in said motor for developing a control signal proportional to the level of magnetic flux present in the air gap of said motor;

a solid-state gate-operated bidirectional switch for controllably delivering power from the source to said main winding in an amount proportional to the conduction angle established by its gate;

regulating means responsive to said control signal and to the instantaneous phase angle of the alternating current for initiating a control pulse timed after a zero crossing of the alternating current by an amount representing said control signal;

and trigger means responsive to said control pulse and to the conduction state of said switch for applying a firing pulse to said gate in correspondence with said control pulse and only in the absence of conduction by said switch.

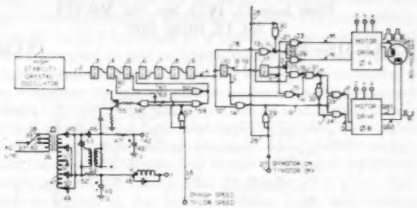
3,855,510
HIGH STABILITY MULTIPLE SPEED MOTOR POWER SUPPLY FOR FACSIMILE

Deward J. Houck, Mastic Beach, N.Y., assignor to International Scanatron Systems Corp., Wyandanch, N.Y.

Continuation of Ser. No. 196,343, Nov. 8, 1971, abandoned. This application Feb. 15, 1973, Ser. No. 332,853

Int. Cl. H02p *7/42*

U.S. Cl. 318—171 **3 Claims**



1. In a synchronous motor drive system, the combination of;

a synchronous two phase motor including two sets of windings, one for each phase;

a crystal controlled high frequency oscillator;

means for dividing the frequency of said oscillator down to predetermined lower frequency signals;

means for providing two phase symmetrical bidirectional pulses at a predetermined rate phased **90** degrees apart from said lower frequency signals;

logic and motor power control means directly coupled between said latter means and the windings of said motor for applying power determined by said pulses to said two phase windings of said motor for rotating said motor in a predetermined direction at a predetermined speed.

3,855,511
TRACTION MOTOR CONTROLLER CIRCUIT AND METHOD

Stephen Hagar Smith, San Pedro, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed July 11, 1973, Ser. No. 378,044

Int. Cl. H02p *7/00*

U.S. Cl. 318—317 **11 Claims**

1. A controller circuit for a traction vehicle comprising:

a battery;

an electronic switch having a control terminal;

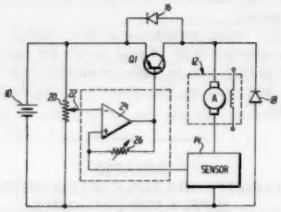
a direct current motor;

a diode;

circuit means connecting said battery, said electronic switch and said direct current motor in series and connecting said diode in parallel with said motor opposing the flow of direct current from said battery through said electronic switch;

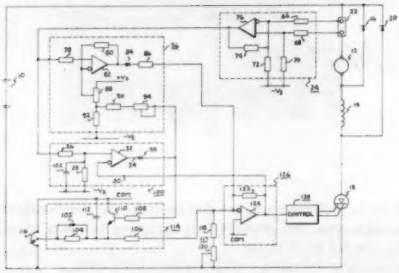
means for continuously sensing the instantaneous direct

current flowing through said motor; and,
means operatively connected and responsive to said sensing



means for controlling the conduction of said electronic switch.

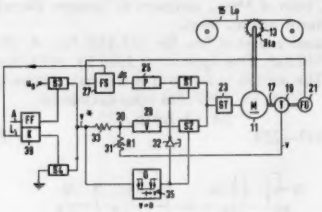
3,855,512
BRAKING-MODE DETECTION CIRCUIT
Charles Edward Konrad, Roanoke, Va., assignor to General Electric Company, Salem, Va.
Filed June 11, 1973, Ser. No. 368,973
Int. Cl. H02p *3/08*
U.S. Cl. 318—366 **19 Claims**



1. A circuit for sensing operation of a direct current motor having an armature and a field winding in a braking mode comprising:
first sensing means for sensing the magnitude of armature current and outputting a first signal representative thereof;
second sensing means for outputting a second signal representative of motor terminal voltage;
output means responsive to said first and said second signals to produce an output signal when the ratio of armature current to motor terminal voltage attains a predetermined value.

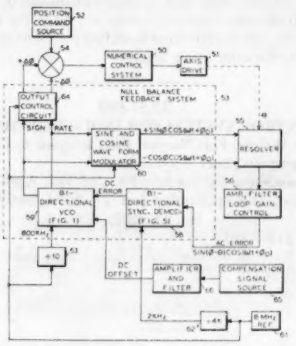
3,855,513
PERFORATED-TAPE READER DRIVE SYSTEM
Julius Brunner, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Apr. 10, 1973, Ser. No. 349,699
Claims priority, application Germany, Apr. 11, 1972, 2217383
Int. Cl. G05b *13/00*
U.S. Cl. 318—561 **6 Claims**

1. A drive system for a perforated tape reader in which the tape is driven by a sprocket comprising:
a. a speed controllable dc motor coupled to the sprocket;
b. means to develop a position control signal;
c. means to develop a velocity control signal;
d. means to selectively couple one of said position and velocity control signals to said motor in response to an input level, said velocity signal being coupled in response to an input level above a predetermined value and said position signal in response to an input level below said predetermined level, and



e. means to provide an input level to said coupling means.

3,855,514
BIDIRECTIONAL VCO FOR A CLOSED LOOP POSITION MEASURING SYSTEM
Thomas M. Zwitter, Newbury, and Ronnie G. Walters, Mayfield Heights, both of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.
Division of Ser. No. 194,426, Nov. 1, 1971, Pat. No. 3,764,831.
This application June 25, 1973, Ser. No. 372,967
Int. Cl. G06f *15/46*
U.S. Cl. 318—660 **10 Claims**



1. In a closed loop position measuring system of a numerical control servomechanism having position follow-up feedback through a mechanical coupling to a moving coil of a three-terminal position feedback device selected from a group consisting of a resolver and an Inductosyn, and having the respective orthogonal stationary coils of said device excited with a carrier signal maintained at a stable frequency and amplitude modulated in accordance with values of sin ϕ and cos ϕ, where ϕ is a phase angle of the closed loop position measuring system continually updated by a single train of pulses in a direction indicated by a binary sign signal to null the amplitude modulation of the output of said moving coil, said amplitude modulation being a trigonometric function of $(\phi-\theta)$, where θ is the position angle of said mechanical coupling, and where said amplitude modulation of said output is detected by a synchronous demodulator receiving a signal from said moving coil to obtain a bipolar DC error signal, the combination of a bidirectional voltage controlled oscillator responsive to said DC error signal for producing said single train of pulses at a frequency proportional to the amplitude of said DC error signal, and for further producing said binary sign signal representing the polarity of said DC error signal, said bidirectional voltage controlled oscillator being comprised of

an analog bipolar integrator responsive to said bipolar DC error signal for producing a ramp output signal having a slope proportional to the amplitude of said DC error signal and a polarity corresponding to the polarity of said DC error signal,

a pair of voltage comparators connected to receive said ramp signal, one comparator for determining when said ramp signal exceeds a predetermined threshold level of a given polarity and the other comparator for determining when said ramp signal exceeds a predetermined threshold level of a polarity opposite said given polarity,

a pulse generating means coupled to said pair of comparators for producing an output pulse of said single pulse train each time said ramp signal crosses one of said threshold levels of either polarity from a level closer to zero,

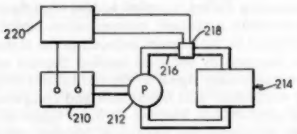
means responsive to said output pulse for resetting said integrator, thereby causing said integrator, pair of comparators and pulse generating means to operate in combination to produce a train of pulses at a rate proportional to the amplitude of said DC error signal, and

a flip-flop having a first input terminal connected to said one comparator for setting said flip-flop to a given state when said ramp signal exceeds said threshold level of said one polarity, and a second input terminal connected to said other comparator for setting said flip-flop to a state opposite said given state when said ramp signal exceeds said threshold level of said other polarity, thereby continually and correctly determining and storing polarity information of said DC error signal for use with said train of pulses.

3,855,515
MOTOR CONTROL CIRCUIT

Burleigh M. Hutchins, Jr., Mansfield, Mass., assignor to Waters Associates, Inc., Framingham, Mass.

Filed Mar. 6, 1972, Ser. No. 232,076
Int. Cl. H02k *37/00*
U.S. Cl. 318—685 **22 Claims**



1. A motor control circuit whereby a bifilar stepping motor is adapted for operation through a large speed range without resonance, comprising

A. means for monitoring a load which is driven by said bifilar stepping motor;

B. means for continuously supplying drivin current to said motor; and

C. control means responsive to said monitoring means for limiting the continuous driving current in accordance with the load being monitored;

and wherein said circuit also comprises

A. means for sensing the current supplied to said motor;

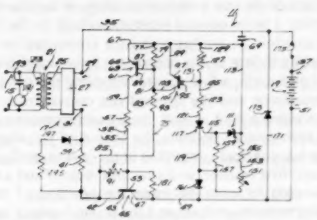
B. means associated with said monitoring means for providing an output current proportional to the load being monitored; anad

C. current summing means providing an output dependent on the difference between the motor current and the monitor current for controlling the driving current supply means.

3,855,516
BATTERY CHARGER

Harold W. Fairchild, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 6, 1973, Ser. No. 385,986
Int. Cl. H02j *7/10*
U.S. Cl. 320—22 **11 Claims**

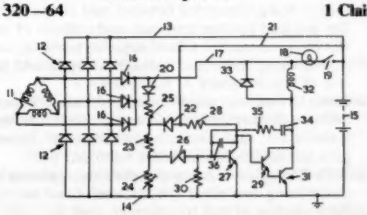


1. A circuit for charging a battery from an alternating current source comprising rectifying means for converting a source of alternating current to direct current, positive and negative battery charging terminals adapted to be respectively connected to like terminals of a battery to be charged, and means connected to said rectifying means and to said battery charging terminals for charging the battery and including a main transistor having an emitter-collector path connected between said rectifying means and one of said battery terminals and also having a base, said battery charging means also including a timer including normally open switch means, means for manually closing said switch means, and means for opening said switch means after expiration of a given time period unrelated to the battery voltage level, said battery charging means also including means subject to said switch means being closed and connected to said transistor base for applying the direct current to said battery charging terminals at a high current level to provide a high charging rate, said battery charging means also including means subject to said switch means being closed and connected to said transistor base for applying the direct current to said battery charging terminals at a reduced current level below said high current level after charging of the battery to a predetermined voltage level, and said battery charging means also including means connected to said transistor base for applying the direct current to said battery charging terminals at a trickle current level lower than said reduced current level when said switch means is open.

3,855,517
BATTERY CHARGING SYSTEMS FOR ROAD VEHICLES

Maurice James Allport, Stourbridge, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed May 1, 1973, Ser. No. 356,129
Claims priority, application Great Britain, May 10, 1972, 21689/70
Int. Cl. H02j *7/24*
U.S. Cl. 320—64 **1 Claim**



1. A battery charging system for a road vehicle, comprising in combination a battery having an earth terminal and a live

terminal, an alternator and associated rectifier producing a d.c. voltage between a first output lead and earth, and also between a second output lead and earth, the first output lead being connected directly to the live battery terminal and the second output lead being connected to the live battery terminal through a warning lamp and the vehicle ignition switch in series, a voltage sensing lead having one end connected to the live battery terminal and its other end connected to earth through a first diode and a resistance chain in series, a Zener diode coupling a point on said resistance chain to the base of an input transistor, an output transistor connected in circuit with the field winding of the alternator between the second output lead and earth, a first resistor coupling the collector of the input transistor and the base of the output transistor to said voltage sensing lead so that the input transistor controls the output transistor to regulate the output of the alternator, said voltage sensing lead connected at the junction of said first diode and said first resistor, and a second resistor and a second diode connected in series between the junction of the first diode and the resistance chain and the second output lead, the arrangement being such that normally current flows through the first diode and the alternator is regulated in accordance with the voltage of the battery, but if the voltage between the second output lead and earth rises above a predetermined value, current flows through the second diode and the alternator is regulated in accordance with the voltage between the second output lead and earth.

3,855,518

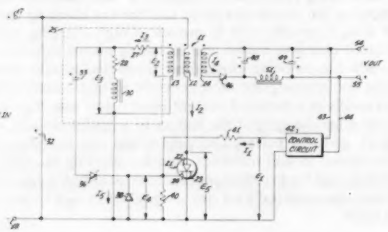
SWITCHING REGULATOR USING GATE-TURN-OFF SCR

Luther L. Genuit, Scottsdale, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 26, 1973, Ser. No. 427,779

Int. Cl. H02m *3/32*

U.S. Cl. 321—2 **8 Claims**



1. A switching regulator for use with an automatically controlled signal source and a power supply having a positive terminal and a negative terminal, said regulator comprising:

a transformer having a primary winding and first and second secondary windings;

a gate-turn-off silicon controlled rectifier having an anode, a cathode and a gate, said primary winding of said transformer being connected between said anode of said rectifier and said positive terminal, said cathode of said rectifier being connected to said negative terminal, said signal source being connected between said gate and said cathode of said rectifier;

a timing circuit, said circuit being connected between a first and a second end of said first secondary winding of said transformer, said circuit being connected between said gate and said cathode of said rectifier;

a diode having an anode and a cathode, said anode of said diode being connected to a first end of said second secondary winding of said transformer; and

a first capacitor, said first capacitor being connected between said cathode of said diode and a second end of said second secondary winding of said transformer.

3,855,519

VOLTAGE CONTROLLER FOR SYNCHRONOUS ELECTRIC MACHINES

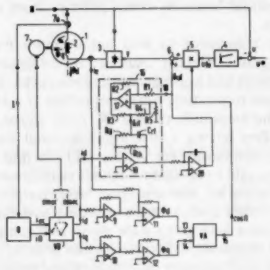
Hermann Waldmann, Weiher b. Erlangen, Wiesentra 14, Germany, assignor to Siemens Aktiengesellschaft, Germany

Filed May 2, 1973, Ser. No. 356,297

Claims priority, application Germany, May 4, 1972, 2221877

Int. Cl. H02p *7/28*

U.S. Cl. 322—20 **8 Claims**



1. In a synchronous electric machine, of the type including a stator winding, an excitation winding, and a voltage controller including a controlled rectifier coupled thereto, which is optimally matched to the parameters of the machine for its non-loaded condition, the improvement comprising:

modulating means, coupled to the excitation winding and controller, for generating a control signal proportional to the cosine of the load angle of the synchronous machine and modulating an output signal generated by the voltage controller according to said generated control signal; and

compensating means, coupled to said modulating means, for generating a voltage compensation signal which is proportional to the current induced in the stator winding of the machine by the load applied thereto and adding said compensation signal to the modulated output signal of the controller, said modulated and compensation signals in combination forming an input signal to the rectifier for increasing the excitation winding current in response to a load applied to the machine.

3,855,520

CONTROL HAVING CONDUCTION LIMIT MEANS TO VARY DUTY CYCLE OF POWER SWITCH

Frederick A. Stich, Milwaukee, Wis., assignor to Allis-Chambers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1972, Ser. No. 317,596

Int. Cl. H02p *7/14*

U.S. Cl. 323—19 **27 Claims**

1. A control for supplying variable duty cycle pulses from an electrical power source to a load including, in combination, means for providing a succession of control pulses,

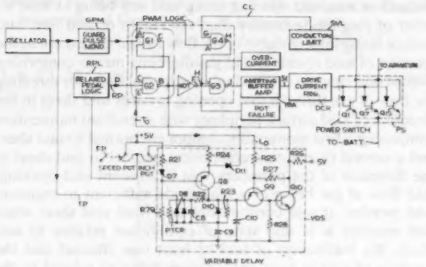
means for selectively varying the duty cycle of said control pulses,

a power switch regulated by said control pulses for connecting said power source to said load,

conduction limit means for sensing the voltage across said power switch and for generating a conduction limit signal when said voltage exceeds a predetermined magnitude,

and

means responsive to said conduction limit signal for overriding said duty cycle varying means and reducing the duty cycle of said control pulses.



3,855,521

TRANSFORMER HAVING SWITCH MEANS FOR CAUSING SERIES OR PARALLEL CONNECTION BETWEEN PLURAL PRIMARY OR SECONDARY WINDING

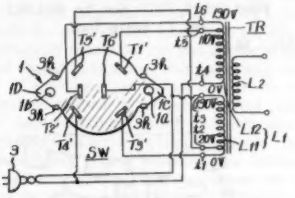
Masao Kiuchi, Saitama-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 21, 1973, Ser. No. 362,061

Claims priority, application Japan, May 24, 1972, 47-60771[U]

Int. Cl. G05f *3/04*

U.S. Cl. 323—49 **6 Claims**



1. A voltage selecting apparatus, comprising:

a transformer having a primary winding and a secondary winding, one of which includes a plurality of separate windings, each of said separate windings having a plurality of taps;

housing means having a plurality of fixed terminals predetermined ones of said fixed terminals being disposed about the periphery of at least two individual coaxial circles and one of said fixed terminals being disposed at the center of said coaxial circles;

conducting means for connecting each of said fixed terminals to a tap;

means for supplying an AC voltage from an external source to said transformer; and

rotary button means mounted for rotation with respect to said housing and having at least two short-circuit members supported in said rotary button means and rotatable therewith, a first of said short-circuit members defining a chord of one of said coaxial circles to thereby selectively short-circuit a pair of said fixed contacts disposed about the periphery of said one coaxial circle in accordance with the rotary position of said button means, and a second of said short-circuit members being in contact with said one fixed terminal disposed at said center of said coaxial circles and being substantially pivotable thereabout to thereby selectively short-circuit said one fixed terminal and a selected fixed terminal disposed about the periphery of another of said coaxial circles in accordance with said rotary position of said button means, such that preselected ones of said taps are electrically interconnected in predetermined circuit configurations whereby a single predetermined output voltage is derived from said transformer when said button means is rotated into corresponding rotary positions associated with different AC voltage magnitudes supplied to said transformer.

3,855,522

ELECTROMAGNETIC TYPE MEASURING APPARATUS FOR DIGITALLY MEASURING ELECTRIC CONDUCTIVITY

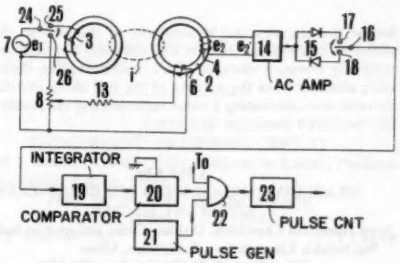
Goro Kobayashi, Oiso-Machi, Japan, assignor to Oki Electric Industry Co., Ltd. and Japan Society for the Promotion of Machine Industry, both of Tokyo, Japan, part interest to each

Filed May 11, 1973, Ser. No. 359,316

Claims priority, application Japan, May 18, 1972, 47-57231

Int. Cl. G01n *27/42*

U.S. Cl. 324—30 A **6 Claims**



1. In an electromagnetic induction type conductivity measuring apparatus of the type comprising a first magnetic core, a first coil wound on said first magnetic core, a source of alternating current, first switch means for supplying an exciting current to said first coil, a second magnetic core, a second coil wound on said second core, a voltage divider connected across said source for impressing a predetermined proportion of the voltage of said source across said second coil, and an output coil wound on said second core, said first and second cores being adapted to be immersed in conductive liquid whose conductivity is to be measured, the improvement which comprises rectifier means coupled to said output coil through the same signal channel for rectifying the voltage induced in said output coil to produce rectified outputs of positive and negative polarities, an integrator, second switch means for selectively supplying the positive or negative rectified output to said integrator, a comparator operable in response to successive opposite polarity intervals of said rectified output applied to said integrator for comparing the output from said integrator with a zero potential, and a pulse counter controlled by the output from said comparator whereby to provide a digital output corresponding to the conductivity of said liquid.

3,855,523

A METHOD AND AN APPARATUS FOR MEASURING THE CAMBER OF A ROLL

Robert Alfred Pirlet, Angleur, Belgium, assignor to Centre de Recherches Metallurgigues - Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Oct. 12, 1971, Ser. No. 188,012

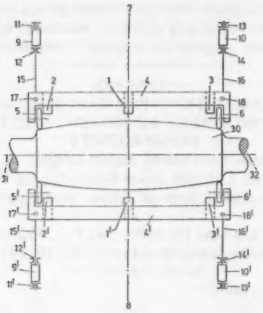
Claims priority, application Belgium, Oct. 22, 1970, 757893

Int. Cl. G01r *33/00*

U.S. Cl. 324—34 D **30 Claims**

1. A method of measuring the camber of a roll, comprising the steps of: providing at least two pairs of distance measuring elements at spaced positions along the roll, the distance mea-

suring elements of each pair being diametrically opposed with respect to the cross-section of the roll, with their measuring axes lying substantially on the prolongation of a given diameter of the roll, each of the elements being contactlessly spaced from the surface of the roll, constraining the elements to



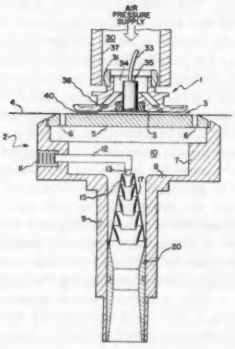
follow the translational movements of the roll so that the elements of each pair remain diametrically opposed at a substantially constant distance apart, measuring the distance of each element from the surface of the roll along the diameter thereof, and calculating a value representing the camber from the measured distances.

3,855,524

MEASURING GAUGE WITH AIR BEARING AND RESISTANT TO TILT

Juan Hamilton Crawford, Dublin, Ohio, assignor to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Sept. 5, 1972, Ser. No. 286,076
Int. Cl. G01r *33/00*
U.S. Cl. 324—34 TK **5 Claims**



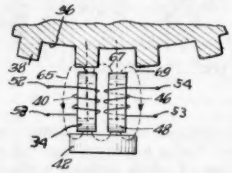
1. In an apparatus for measuring a property of a material sheet, including a member connected to a mount means allowing movement of said member relative to said sheet, said member comprising a sensor means for responding to said sheet property and a substantially flat surface which is to be maintained at a constant distance from said sheet by means including a gas film interposed between said surface and said sheet, said gas film being maintained by a flow of gas from gas-directing means in said member connecting a gas-confining chamber in said member with said surface and maintaining said member substantially in a state of equilibrium with respect to said sheet but subject to tilting movement relative to said sheet, the improvement wherein said gas-directing means comrises at least one gas-discharging opening in said surface located at a position that is slightly greater than halfway towards the periphery of said surface along a line between the center and the periphery of said surface, the distance across said opening along said line being at least an order of magnitude smaller than the length of said line, said surface being impermeable to the flow of said gas except at the location of said opening, said gas-directing means comprising at least one channel inclined relative to said sheet for directing the flow of gas through said opening towards said sheet in the direction of said surface periphery with a resultant momentum comprising a first momentum component normal to said sheet and a second momentum component parallel to said sheet in the direction of the periphery that is adjacent said opening, said flow of gas being of a magnitude sufficient to maintain said member at said constant distance from said sheet when said member is in said state of equilibrium relative to said sheet, the inclination of said at least one channel and the location of said at least one opening being so related to the flow of gas from said opening to the periphery that substantially maximum variations in gas pressure occur at different points on said surface when said member is tilted relative to said sheet to produce a substantially maximum restorative action tending to restore said member to said state of equilibrium, while for the same inclination and location the amount of said restorative action first increases in a substantially linear relationship with an increase in the angle at which said member is tilted, tilted relative to said sheet and then increases more markedly in a substantially nonlinear relationship as said member further approaches contact with said sheet.

3,855,525

ANGULAR VELOCITY SENSOR

Victor Maurice Bernin, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 5, 1973, Ser. No. 404,062
Int. Cl. G01p *3/48*
U.S. Cl. 324—34 D **4 Claims**

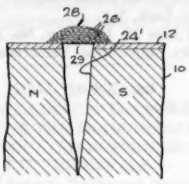


1. A velocity sensing device comprising a sensing means, a rotating member having teeth on its periphery which are capable of conducting magnetic flux to create a time-varying magnetic field with respect to said sensing means, said sensing means comprising a pair of magnetic cores positioned adjacent the periphery of said rotating member, a winding on each of said cores, excitation generator means coupled to supply a carrier signal of a first phase to one of said windings and a carrier signal of a second phase to the other of said windings, said second phase being 180° out of phase with respect to said first phase, and a pair of impedances which are not effected by said magnetic field connected together and to said windings to form a four-arm bridge circuit having a pair of output terminals at which a composite signal results due to said carrier signals and to the rotation of said member, the centerlines of said cores being spaced such that when the centerline of one core is aligned with the centerline of a tooth, the centerline of the other core is approximately aligned with the centerline of the space between said tooth and the next adjacent tooth.

3,855,526
METHOD OF MAGNETIC PARTICLE TESTING USING STRIPPABLE COATINGS

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 16, 1973, Ser. No. 360,988
Int. Cl. G01r 33/12
U.S. Cl. 324—38 4 Claims



1. A method for nondestructive magnetic inspection of an object, for detection of defects and discontinuities in the surface of said object, which comprises applying a strippable coating containing a coloring material to said object, said colored coating contrasting with the color of said object, establishing a field of magnetic flux lines relative to said object so that lines of flux pass at an angle to said defects and discontinuities in the surface of said object, applying a suspension of non-fluorescent magnetic particles in a liquid medium over said colored coating, said suspension consisting essentially of a liquid hydrocarbon vehicle, a water soluble surfactant and said magnetic particles, and causing said magnetic particles to agglomerate on said coating adjacent to said defects and discontinuities, said magnetic particles having a color which contrasts with the color of said coating, to provide magnetic particle indications of said defects and discontinuities, gently treating said coated surface containing said magnetic particle indications in a solvent, said magnetic particle indications being maintained in their initial agglomerated positions, applying over said strippable coating and over said magnetic particle indications, a second clear, strippable coating, and stripping the coating system including said colored coating containing said magnetic particle indications and said clear coating from the surface of said object, to provide a record of said defects and discontinuities in the surface of said object.

3,855,527
METHOD AND SYSTEM FOR DETERMINING THE RESISTANCE OF THE DIELECTRIC IN A CAPACITOR

Otto T. Masopust, Jr., Bolingbrook, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 7, 1974, Ser. No. 431,174
Int. Cl. G01r 27/26
U.S. Cl. 324—60 C 16 Claims

1. The method of determining the dielectric resistance of a capacitor with respect to a limit value, which comprises:

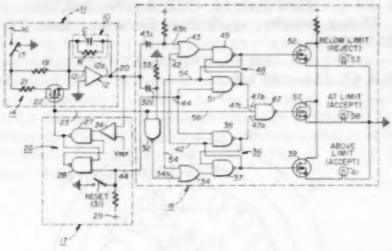
applying charging potential through a selectively variable resistance network to charge the capacitor;

detecting when the capacitor has attained a set charge which is equal to the charge that would be accumulated on a capacitor having dielectric resistance equal to the limit value if fully charged through a resistance of predetermined value;

initially setting the variable resistance network at a low resistance level so that the capacitor is rapidly charged when the charging potential is applied through the variable resistance network;

subsequently increasing the resistance value of the variable resistance network to the predetermined value upon detecting that the capacitor has attained the set charge; and

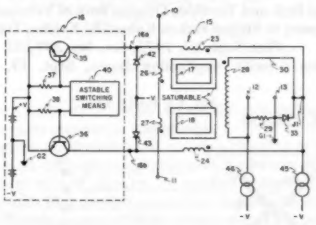
ascertaining whether the capacitor is stable, still charging or discharging, to determine whether the dielectric resistance of the capacitor is at, above or below the limit value, respectively.



3,855,528
D-C CURRENT MEASURING CIRCUIT

Harold J. Brown, Lorain, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio

Filed Apr. 6, 1973, Ser. No. 348,498
Int. Cl. G01r 1/22, 19/00
U.S. Cl. 324—117 R 11 Claims



1. In a circuit for establishing a current indication which varies in accordance with the magnitude of a d-c command current, in combination, first and second saturable cores each having a gate winding and a command winding, a control winding linking said first and second cores, means for connecting said command windings in series, means for connecting first respective ends of said gate windings, means for connecting a first end of said control winding to said connected ends of said gate windings, a first path for conducting current flow through either of said gate windings and through said control winding, a second path for conducting a circulating current through said control winding when no appreciable current flows through either of said gate windings, current indicating means for indicating the amplitude of current flow through said control winding, means for connecting said current indicating means to said control winding, and means for applying a chopped d-c voltage to the second end of one of said gate windings and for applying a complementary chopped d-c voltage to the second end of the other of said gate windings.

3,855,529

MEASURING ARRANGEMENT FOR DETERMINING THE AIR-GAP FLUX OF A ROTATING-FIELD MACHINE

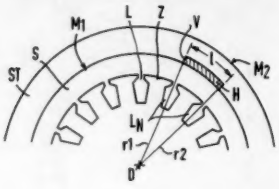
Frank Langweiler, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed June 14, 1972, Ser. No. 262,731

Claims priority, application Germany, June 19, 1971, 2130556

Int. Cl. G01r *33/02, 33/06*

U.S. Cl. 324—158 MG 5 Claims



1. Arrangement for determining the air-gap flux of a rotating-field machine having a laminated stator and a rotor having a plurality of slots, the inner surface of the stator and the rotor conjointly defining a working air-gap, comprising recess means formed in the inner surface of the stator, and a semiconductor arrangement responsive to a magnetic field disposed in said recess means and having a sensitive region extending in the circumferential direction of the stator a distance corresponding approximately to the projection of the rotor slot pitch onto the inner surface of the stator.

3,855,530

MAGNETIC METAL DEFECT-DETECTING APPARATUS

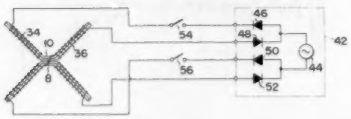
Takashi Fuji, and Yasuhide Otsuka, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 17, 1973, Ser. No. 397,655

Claims priority, application Japan, Sept. 19, 1972, 47-93845

Int. Cl. G01r *33/12*

U.S. Cl. 324—37 6 Claims



1. A magnetic metal defect-detecting apparatus comprising:

a cross-shaped magnetic core assembly including two pairs of magnetic pole members providing two pairs of magnetic poles intersecting each other;

a first and a second coil wound about the two pairs of magnetic pole members;

a power supply device including a source of single phase alternating current;

at least one first rectifier connected in series between the source of single phase alternating current and the first coil in the forward direction with respect to the positive half wave of the single phase alternating current for supplying the first coil with single phase alternating current of positive half wave; and

at least one second rectifier connected in series between the source of single phase alternating current and the second coil in the forward direction with respect to the negative half wave of the single phase alternating current for supplying the second coil with single phase alternating current of negative half wave;

thereby alternately applying each of two magnetic fluxes in intersecting directions.

3,855,531

METHOD OF TESTING THE SEALS OF FOOD CONTAINERS AND CONTAINERS SUITABLE THEREFOR

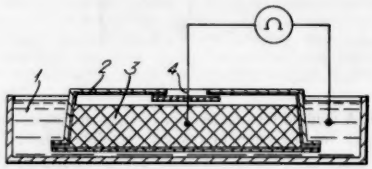
Jozef Frans Fielibert, Zevenaar, and Adrianus Van Rooijen, Didam, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed June 28, 1972, Ser. No. 266,939

Claims priority, application Netherlands, July 1, 1971, 7109071

Int. Cl. G01r *27/02*

U.S. Cl. 324—65 R 2 Claims



1. A method of testing the effectiveness of the seal of a free-standing thin-walled container containing therein an electrically conductive food product said container providing an electrically insulated barrier between the food product and the exterior of the container comprising the steps of inserting an electrode in a wall of the container, the electrode being in electrical contact at one portion thereof with the food product and in electrical contact at another portion thereof with a point outside of the container while being electrically insulated from the container immersing the container in an electroltye, connecting the portion of the electrode outside of the container with a source of electrical current while maintaining electrical insulation between said electrode and the electrolyte, removing the container from the electrolyte and removing the electrode from the wall of the container.

3,855,532

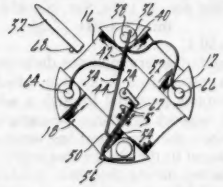
ELECTRICAL GAUGE INDICATOR RETURN DEVICE

Gary F. Woodward, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 5, 1973, Ser. No. 422,112

Int. Cl. G01r *1/00, 5/16, 5/26*

U.S. Cl. 324—154 3 Claims



1. An indicator return device for an electrical gauge having a frame and an indicator attached to a shaft pivotally mounted in said frame, said indicator return device being designed to move said indicator to a predetermined position upon the cessation of the supply of electrical power to said gauge and comprising: a cam attached to said gauge shaft, a bimetallic strip attached to said frame and extending therefrom, a leaf spring attached to said frame and extending therefrom, said

leaf spring and bimetallic strip being in contact with one another and said leaf spring urging said bimetallic strip in a direction away from said shaft and cam mounted thereon, said bimetallic strip having a first position when said gauge is not connected to a source of electrical energy wherein one end of said bimetallic strip is in contact with said leaf spring at a point thereon located intermediate the ends of said leaf spring and said bimetallic strip having a second position when said gauge is connected to a source of electrical energy wherein one end of said leaf spring is in contact with said bimetallic strip at a point thereon located intermediate the ends of said bimetallic strip.

3,855,533
SYSTEM INCLUDING A TRANSMITTER AND A RECEIVER FOR THE TRANSMISSION OF BINARY SIGNALS LOCATED IN PERIODICAL CLOCK INTERVALS

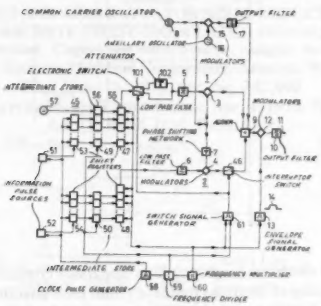
Alexander Alfred Schueli, Neuhausen, Switzerland, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 1, 1973, Ser. No. 366,059

Claims priority, application Netherlands, June 28, 1972, 7208875

Int. Cl. H04b *3/00*

U.S. Cl. 325—60 **12 Claims**



1. A system of the type including a transmitter and a receiver for the transmission of binary pulse signals located in periodic intervals by means of phase modulation, comprising at the transmitter end a phase modulator provided with at least two parallel-arranged channels on an input side thereof, each channel incorporating a modulator, a combination device, and with a common carrier oscillator which feeds the two modulators with carrier oscillations which are mutually shifted 90° in phase, the outputs of the two modulators being combined in the combination device for transmission through a transmission path, while the receiver includes a phase demodulator which is provided with at least two parallel-arranged channels connected on the input side to the transmission path and each incorporating a modulator, and with an arrangement for local carrier recovery which is stabilized on the transmitter carrier oscillations for demodulation of the transmitted binary pulse signals and which feeds the two modulators with carrier oscillations which are mutually shifted 90° in phase, the pulse signals derived from each of the outputs of the two modulators being applied through a pulse regenerator to a user, the improvement wherein a synchronizing interval having a duration of at least one clock interval is reserved for phase stabilization in the rhythm of a periodic cycle period corresponding to an integral number of clock intervals, a synchronizing signal generator being connected at a transmitter end to the modulator in the first of the two transmission channels, said generator comprising means for applying a predetermined pulse signal as a synchronizing signal to the input of the modulator incorporated in said channel during the synchronizing intervals, the second of the two channels incorporating an interruptor switch means connected to said synchronizing signal generator for interrupting the second transmission channel at the instants of the synchronizing intervals, while in the receiver the arrangement for local carrier recovery comprises blocking arrangement means for selectively phase reversing the received carrier signal, a synchronizing interval selection means for selecting the synchronizing intervals of a lower signal level, a phase stabilization channel means for connecting the output of the modulator in the receiver channel corresponding to the second transmission channel to the blocking arrangment which for the purpose of phase stabilization is released by a switching signal at synchronizing intervals originating from the synchronizing interval selector means which is fed by the received phase-modulated oscillations.

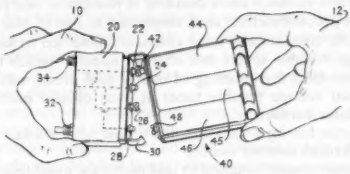
3,855,534
APPARATUS FOR PROVIDING POWER TO PORTABLE RADIO TRANSMITTERS

Jack N. Holcomb, Galt Towers, Ocean Dr., and Hans D. Sylten, both of Fort Lauderdale, Fla., assignors to said Holcomb, by said Sylten

Filed Apr. 23, 1973, Ser. No. 353,495

Int. Cl. H04b *5/06*

U.S. Cl. 325—118 **2 Claims**



1. The combination of an attachable power supply with portable radio apparatus, comprising:

a. a battery receptacle case having a plurality of batteries,

b. a portable radio apparatus having a battery attachment section with a plurality of parallel connected positive terminals and parallel connected negative terminals,

c. the battery receptacle case having means for attachment to the radio apparatus adjacent the positive and negative terminals,

d. positive electrical connecting means mounted on the battery receptacle case for providing direct attachment to one of the positive terminals of the radio apparatus,

e. negative electrical connecting means mounted on the battery receptacle case for providing direct attachment to one of the negative terminals of the radio apparatus,

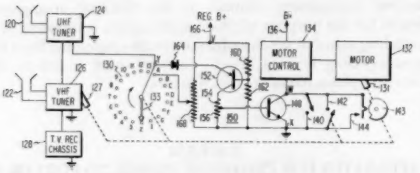
f. electrical connecting means integral with the battery case for interconnecting said plurality of batteries electrically with the positive and negative electrical connecting means on the battery receptacle case,

g. the electrical connecting means including switch means having a first position for electrically connecting the plurality of batteries in parallel with the positive and negative electrical means of the battery receptacle case, h. the switch means having a second position for alternately electrically connecting the plurality of batteries in series with the positive and negative electrical connecting means of the battery case, whereby the signal emanating from the radio apparatus can be maintained at a satisfactory signal level for a limited period of time after the batteries become weak and supply insufficient power to the radio apparatus when they are connected in parallel.

3,855,535
PROGRAMMING SYSTEM FOR A MOTOR-DRIVEN TELEVISION RECEIVER TUNING APPARATUS

James Courtland Marsh, Jr., Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 22, 1973, Ser. No. 362,713
Int. Cl. H04b 1/16
U.S. Cl. 325—471 5 Claims



1. In a motor driven television receiving tuning apparatus employing a voltage tunable tuner capable of processing signals associated wiht each of a plurality of signal channels in a band of frequencies, a system for providing selective bypassing of positions of a channel selector switch employed to provide for reception of selected ones of said plurality of signal channels, comprising:

a plurality of potentiometers each having an adjustable contact providing a preset voltage;

a channel selector switch including at least a plurality of stator contacts corresponding in number to said plurality of potentiometers, each connected to one of said adjustable contacts and rotor contacts connected to said voltage tunable tuner, said channel selector switch thereby providing for coupling of one of said preset voltages to said voltage tunable tuner at each of said plurality of stator contacts;

a motor having a shaft coupled to said rotor contact of said channel selector switch;

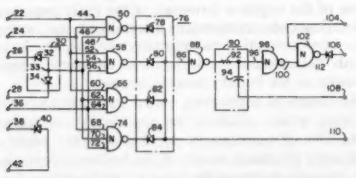
a motor control coupled to said motor for providing energization of said motor; and

means coupled to said rotor contact of said channel selector switch for sensing a select range of voltage supplied from said plurality of potentiometers via said rotor and for providing a switching signal only when said select range is being sensed, said switching signal being coupled to said motor control to maintain energization of said motor.

3,855,536
UNIVERSAL PROGRAMMABLE LOGIC FUNCTION

James A. Neuner, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 4, 1972, Ser. No. 241,038
Int. Cl. H03k 19/08, 19/36, 19/44
U.S. Cl. 328—92 31 Claims



1. A programmable, universal logic module comprising:

logic means having a number of p input means where p is an integer greater than or equal to one, and a first output means, each of said input and output means capable of assuming either a first or second logical state, respectively, said logic means including a plurality of NAND gates, an AND gate having a plurality of inputs from the respective outputs of said NAND gates and an inverter having an input from said AND gate output and wherein the output of said inverter forms said first output means;

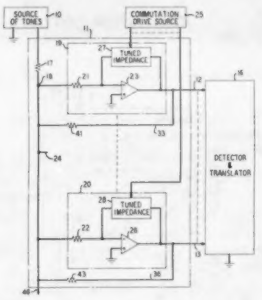
n signal means, where n is an integer less than or equal to p, operably connected to n of said p input means, so as to provide at least one logical input signal to said logic means; and

the remainder of said p minus n input means operably arranged so as to provide an output signal of said first state at said first output means whenever at least m of said n signal means assume said first state, where m is a predetermined integer less than or equal to n.

3,855,537
BAND-SEPARATION FILTER WITH REDUCED PATH CROSS-CONNECTIONS

Joseph Henry Condon, Summit, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Aug. 9, 1973, Ser. No. 387,126
Int. Cl. H03b 1/04
U.S. Cl. 328—167 10 Claims



1. An electrical frequency filter apparatus comprising

a plurality of bandpass frequency filter units covering different frequency bands and connected to be fed electrical signals from a common input connection,

means, in each filter unit, for degeneratively feeding back an output of such unit to an input thereof for all but a different one of said bands, and

means for degeneratively feeding back outputs of all of said units back to said common input connection to effect substantially complete cancellation of said different bands in such input for producing a degenerated input.

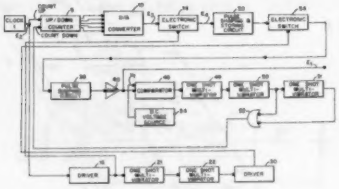
3,855,538
MEANS AND METHOD FOR PROVIDING HIGHLY STABLE REFERENCE

John M. Jones, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Feb. 16, 1973, Ser. No. 333,074
Int. Cl. H03b 3/02; H03k 5/00
U.S. Cl. 328—175 8 Claims

1. A network for providing reference pulses comprising means for providing a pulse train, clock means for providing clock pulses at a predetermined frequency, means connecting the clock means to the pulse train means for changing the amplitude of a pulse in the pulse train by a predetermined amount in response to a clock pulse from the clock means, means for providing a reference voltage, means connected to the pulse train means, to the reference voltage means and to the changing means for controlling the amplitude of a next subsequent pulse in the pulse train in a manner so that the next subsequent pulse amplitude is changed by the predetermined amount in one direction when the amplitude of a current pulse in the pulse train does not exceed the reference voltage and

the next subsequent pulse amplitude is changed in an opposite direction by the predetermined amount when the current pulse amplitude exceeds the reference voltage so that the



amplitude of the pulses in the pulse train are maintained at a substantially constant level, and means connected to the pulse train means for providing the pulses of the pulse train as the reference pulse.

3,855,539

METHOD AND APPARATUS FOR NOISE REDUCTION IN DISCRETE PHASE MODULATED SIGNALS

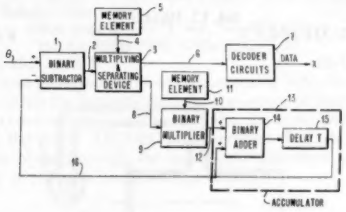
Alain Croisier, Cagnes sur Mer, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1973, Ser. No. 342,005

Claims priority, application France, Apr. 4, 1972, 72.12014

Int. Cl. H04b *1/10*; **H03k** *5/01*

U.S. Cl. 329—104 **8 Claims**



1. A method for demodulating discrete phase modulated signals and for selectively reducing the phase shift contributions thereto caused by one or more types of transmission impairments such as white noise, frequency shift, phase distortion, or jitter, the method comprising the steps of:

forming a difference signal from each discrete signal of phase magnitude θ and reference value R;

multiplying the difference signal by a first coefficient of the value $M/2\pi$, M being the total number of distinct values that can be used to phase encode the data;

partitioning the product into an integral valued portion thereof X representing the phase modulation of the data and a fractional valued portion F representing the phase modulation of the transmission impairments, the phase shift contribution of the impairments being less than π/M radians;

multiplying the fractional valued portion F by a second coefficient α, α lying within the range $0 \quad \alpha < 2$; and

integrating the product αF to derive the said reference value R which constitutes a prediction of the phase shift contribution due to the transmission impairments for each discrete phase signal θ.

3,855,540

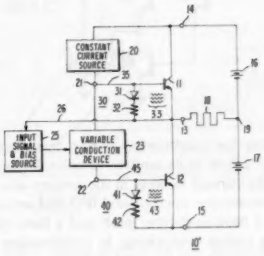
PUSH-PULL TRANSISTOR AMPLIFIER WITH DRIVER CIRCUITS PROVIDING OVER-CURRENT PROTECTION

Arthur John Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 13, 1973, Ser. No. 424,418

Int. Cl. H03f *3/26*

U.S. Cl. 330—14 **24 Claims**



13. An amplifier comprising:

first and second bipolar transistors, each having emitter and collector electrodes with a collector-to-emitter path therebetween and each having a base electrode and a base-emitter junction between its said emitter and said base electrode;

first and second semiconductor junction diodes;

first and second linear resistive elements;

a serial combination of said first semiconductor junction diode and said first linear resistive element connected in a first parallel combination with said first transistor base-emitter junction, with said first semiconductor junction being poled for concurrent forward conduction with said first transistor base-emitter junction;

a serial combination of said second semiconductor junction diode and said second linear resistive element connected in a second parallel combination with said second transistor base-emitter junction, with said second semiconductor junction being poled for concurrent forward conduction with said second transistor base-emitter junction;

means responsive to input signal thereto applied to supply first and second signal currents which are in push-pull relationship to each other and to said first and said second parallel combinations, respectively; and

means for connecting the collector-to-emitter paths of said first and said second transistors in series for application of operating potential and in push-pull for supplying an output signal responsive to said first and second signal currents.

21. An amplifier comprising, in combination:

a pair of terminals between which an operating voltage may be applied;

two semiconductor devices, each having a conduction path and a control electrode for controlling the conductance of said path, said conduction paths connected in series between said terminals;

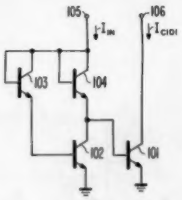
a current source providing a constant current at a level lower than that which will damage either device;

and means including a signal responsive variable conductance means receptive of the current provided by said source, for supplying one portion of said current to one control electrode and the other to the other control electrode, in accordance with the value of a parameter of said signal.

3,855,541
CURRENT PROPORTIONING CIRCUIT

Arthur John Leidich, Flemington, N.J.

Filed Oct. 5, 1973, Ser. No. 404,123
Int. Cl. H03f 3/04
U.S. Cl. 330—22 9 Claims



1. A circuit for conditioning a first transistor to have an output current flow in its emitter-to-collector path which is a fraction of the current flowing in the emitter-to-collector path of a second transistor, each of said first and second transistors also having a base-to-emitter path and a base electrode, said conditioning circuit comprising, in combination:

an input terminal for an input current;

an output terminal for said output current to which said first transistor collector electrode is connected;

a common terminal to which the emitter electrodes of said first and said second transistors are connected;

two non-linear circuit means having substantially the same current versus voltage characteristics each of said non-linear circuits maintaining an offset potential thereacross logarithmically related to the current flow therethrough, one said non-linear circuit means connected between said input terminal and said collector electrode of said second transistor for conducting a first portion of said input current flowing as the collector current of said second transistor and the other such non-linear circuit means connected between said input terminal and the base electrode of said second transistor for conducting a second portion of said input current flowing as the base current of said second transistor; and

means for maintaining the potential across the base-to-emitter path of said first transistor at the potential appearing across the collector-to-emitter path of said second transistor.

3,855,542
BROAD BAND HIGH FREQUENCY DIODE AMPLIFIER

Martin I. Grace, Framingham, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Nov. 5, 1973, Ser. No. 413,119
Int. Cl. H03b 7/14
U.S. Cl. 330—34 8 Claims

1. A high frequency signal amplifier comprising:

transmission line means having first and second high frequency signal conducting means,

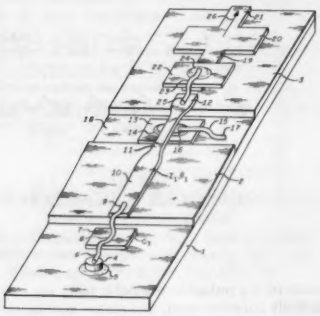
said first high frequency signal conducting means including first and second signal conducting portions supported in substantially parallel relation with respect to said second high frequency signal conducting means,

first series resonant circuit means including diode means coupled between said second high frequency signal conducting means and a first end of said first signal conducting portion,

second series resonant circuit means coupled between the second end of said first signal conducting portion and the first end of said second signal conducting portion,

shunt resonant circuit means coupled to said first signal conducting portion and to said second high frequency signal conducting means intermediate said first and second ends of said first signal conducting portion,

bias circuit means connected to said second end of said second signal conducting portion and said second high

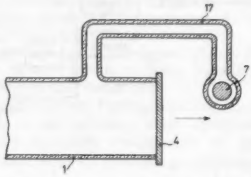


frequency signal conducting means for supplying a bias signal through said diode means.

3,855,543
DEVICE FOR PRODUCING STIMULATED INFRARED EMISSION

Abraham Timmermans, and Robertus Laurentius Clemens de Vaan, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 22, 1973, Ser. No. 325,882
Claims priority, application Netherlands, Feb. 21, 1972, 7202271
Int. Cl. H01s 3/22
U.S. Cl. 331—94.5 T 8 Claims



1. In an iraser for producing stimulated infrared emission: a discharge tube containing at least a mixture of carbon dioxide and water vapor;

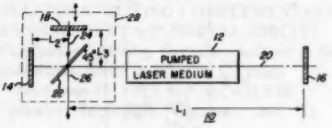
electric discharge means supported by said discharge tube for producing an iraser beam; and

means for maintaining the stimulated infrared emission substantially at the most efficient level for said tube by maintaining the pressure of said water vapor in said tube at a predetermined value, said means comprising a quantity of zeolite that contains water vapor and is disposed within said tube and is thermally coupled to said beam to be heated thereby to give off water vapor, the thermal coupling between said zeolite and said beam being such that said zeolite is heated to a predetermined temperature to give off enough water vapor to maintain said water vapor at said predetermined value when the stimulated emission is at substantially its maximum efficiency, the efficiency of said emission dropping when said water vapor exceeds said predetermined value.

3,855,544
FREQUENCY SELECTIVE OUTPUT COUPLING FOR LASERS

Colin Bowness, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 28, 1966, Ser. No. 590,350
Int. Cl. H01s *3/08*
U.S. Cl. 331—94.5 **8 Claims**



1. A frequency selective output coupling for coupling the output beams of a plurality of laser resonant cavities into a single output beam, said plurality of laser resonant cavities each including a laser medium, a cavity axis and end reflectors, wherein said laser cavities are positioned in parallel, said coupling comprising:

partial reflecting means positioned adjacent each of the laser mediums at a selected angle to each cavity axis for coupling energy out in two coaxial oppositely directed beams, and

an adjustable reflecting means positioned in one of said beams to reflect it back along itself and back through the partial reflecting means to superimpose said two beams to form a single output beam.

3,855,545
LASER GLASS HOST COMPOSITIONS COMPRISING TeO_2, BaO, Li_2O

Richard F. Cooley, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

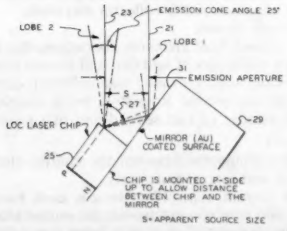
Filed June 27, 1973, Ser. No. 373,922
Int. Cl. H01s *3/00*; **C03c** *3/12*, *3/30*
U.S. Cl. 331—94.5 E **10 Claims**

1. A laser glass host composition comprising TeO_2, BaO and Li_2O in which the proportions in molar amounts of TeO_2, BaO and Li_2O are defined by the areas within the heavy lines connecting the points ABCDEF of the ternary diagram of the FIGURE of the drawings, the laser glass composition being a host for an effective lasing amount of Nd_2O_3.

3,855,546
FOLDED LOBE LARGE OPTICAL CAVITY LASER DIODE

David L. Carr, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 21, 1973, Ser. No. 399,565
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 H **8 Claims**

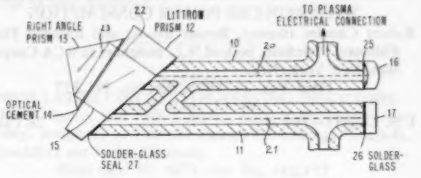

EMISSION CONE ANGLE 25°
LOBE 2
LOBE 1
EMISSION APERTURE
LOC LASER CHIP
MIRROR (AU) COATED SURFACE
CHIP IS MOUNTED P-SIDE UP TO ALLOW DISTANCE BETWEEN CHIP AND THE MIRROR
S=APPARENT SOURCE SIZE

1. An improved large optical cavity laser diode arrangement comprising: a) means having at least one plane surface which is light reflecting; and b) an optical cavity laser diode mounted on said plane surface such that one of the two major lobes emitted by the laser diode is reflected so as to have its major axis parallel to the major axis of the other lobe.

3,855,547
OPTICAL CAVITY FOR A LASER

Joseph Pennell Kirk, Rockville, Md., assignor to International Bussiness Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,354
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 C **5 Claims**



1. A laser with a single critical surface Brewster window, comprising:

a laser cavity having a principal optical axis along which is propagated the laser beam;

a Littrow prism having a first planar face located on said principal optical axis, oriented at Brewster's angle with respect thereto, and mounted as a windown in contact with said laser cavity, for admitting a refracted, plane polarized component of said laser beam incident along said principal axis;

said Littrow prism having a second substantially planar face which intersects said first face along a line perpendicular to said principal axis, at an angle with respect to said first face such that said second face is substantially perpendicular to said refracted component of said laser beam;

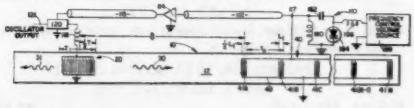
a reflecting means in contact with said second face and normal to the direction of propagation of said refracted, plane polarized component for reflecting said component back upon itself and out of said first planar face of said prism along said principal axis;

whereby laser action is sustained generating a polarized laser beam, with a Brewster window having only one critical surface.

3,855,548
ULTRA HIGH FREQUENCY SINGLE MODE OSCILLATION CONTROLLED BY A SURFACE ACOUSTIC WAVE CRYSTAL

Arabinda K. Nandi, Anaheim; Sam T. Costanza, Santa Ana, and Charles E. Wheatley, III, Newport Beach, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 18, 1973, Ser. No. 407,695
Int. Cl. H03b *5/32*
U.S. Cl. 331—107 A **7 Claims**



1. An oscillator comprising

an amplifier having a surface acoustic wave delay line in a feedback path, wherein the delay line comprises:

a substrate capable of supporting surface acoustic waves; and

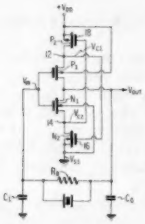
first and second transducers each disposed in coupling relation to said substrate;
said first transducer comprised of a plurality of taps connected in parallel,
each said tap comprising an interdigital transducer;
said taps being spaced center-to-center by an integral multiple of the wave length of a desired oscillation frequency so that each tap will produce an in-phase output signal at said desired frequency; and
said second transducer comprising an interdigital transducer.

3,855,549

CIRCUIT, SUCH AS CMOS CRYSTAL OSCILLATOR, WITH REDUCED POWER CONSUMPTION

Robert Charles Huener, Bound Brook, and Richard Plumb Fillmore, Plainfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1973, Ser. No. 391,357
Int. Cl. H03b *5/36*
U.S. Cl. 331—108 D **26 Claims**



20. In combination:
first and second controllable impedance means;
two operating voltage terminals;
an input terminal;
an output terminal;
first and second semiconductor devices of different conductivity types, each having a conduction path and a control electrode for controlling the conductivity of its conduction path, both control electrodes connected to said input terminal, the conduction path of said first device connected in series with said first controllable impedance means between said output terminal and one of said operating voltage terminals and the conduction path of said second device connected in series with said second controllable impedance means between said output terminal and the other operating voltage terminal; and
first and second feedback paths, the first coupled between said first device and said second controllable impedance means and the second coupled between said second device and said first controllable impedance means.

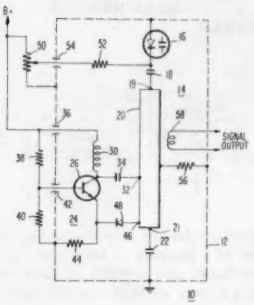
3,855,550

TRANSISTOR OSCILLATOR WITH DIODE IN FEEDBACK CIRCUIT PROVIDING AMPLITUDE STABILIZATION

David John Carlson, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1973, Ser. No. 391,417
Int. Cl. H03b *3/02, 5/12*
U.S. Cl. 331—109 **12 Claims**

1. An oscillator comprising:
a resonant circuit including at least an inductance element and a capacitance element;
an amplifying device having first, second and third electrodes;
biasing means coupled between said second and third electrodes for conditioning said amplifying device for conduction;
means for coupling said resonant circuit to said first electrode; and



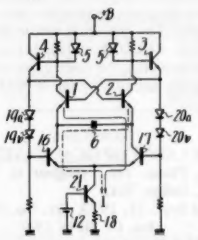
rectifier means coupling said resonant circuit to said third electrode of said amplifying device for sustaining oscillations in said resonant circuit, said rectifier means further providing charging of said capacitance element and reducing of the amplitude of oscillations fed back to said third electrode upon an increase of a first polarity portion of said oscillations beyond a predetermined level.

3,855,551

MULTIVIBRATOR CIRCUIT

Yoshio Ishigaki, and Masayuki Hongu, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 14, 1973, Ser. No. 424,782
Claims priority, application Japan, Dec. 22, 1972, 47-129099
Int. Cl. H03k *3/282*
U.S. Cl. 331—113 R **10 Claims**



1. A multivibrator circuit comprising:
first and second transistors each having a base electrode, an emitter electrode and a collector electrode;
voltage supply means;
first and second load elements connecting the respective collector electrodes of said first and second transistors to said voltage supply means, said collector electrodes of said first and second transistors being coupled to said base electrodes of said second and first transistors, respectively;
a capacitor connected between the emitter electrodes of said first and second transistors;
a pair of current controlling devices each having input, output and common electrodes, the output electrodes of said current controlling devices being connected to separate emitter electrodes of said first and second transistors, the common electrodes of said current controlling de-

vices being connected to a constant current source, and said pair of current controlling devices being controlled by the application of said input electrodes of the output signal produced by said first and second transistors, whereby said emitter electrodes of said first and second transistors are alternately connected to said constant current source through said current controlling devices to provide a constant duty ratio.

3,855,552
OSCILLATOR UTILIZING COMPLEMENTARY TRANSISTORS IN A PUSH-PULL CIRCUIT

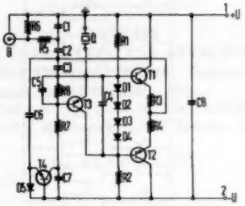
Gerhard Thanhaeuser, Mering, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 17, 1973, Ser. No. 424,928

Claims priority, application Germany, Dec. 21, 1973, 2262782

Int. Cl. H03b *5/36*

U.S. Cl. 331—116 R **6 Claims**



1. An oscillator circuit comprising an oscillatory circuit, first and second complementary transistors connected in a push-pull configuration and each having a base and connected to said oscillatory circuit, and a variable voltage divider connected between said bases for adjusting the working points of said first and second complementary transistors, said variable voltage divider comprising a third transistor including a base connected to said oscillatory circuit and an emitter and a collector connected to respective bases of said first and second complementary transistors and a collector-emitter region driven toward progressively lower and lower resistance in response to increasing amplitude of oscillation.

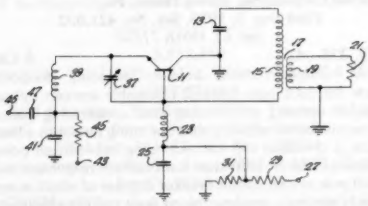
3,855,553
MODULATED TRANSISTOR OSCILLATORS

John E. Cronin, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 3, 1966, Ser. No. 593,262

Int. Cl. H03b *5/12*

U.S. Cl. 331—117 R **3 Claims**



1. A modulated transistor oscillator comprising a junction transistor having a base, collector and emitter means connected to said transistor for biasing said transistor in a Class C mode, at a frequency such that the transistor reactance forms an appreciable part of the reactance of said biasing means, with the angle of conduction of said transistor in each cycle of oscillation being less than 180°, said biasing means comprising a first inductor and first capacitor serially connected between the base terminal of the junction transistor and ground, a resonant tank circuit including a second capacitance and second inductance serially connected between the collector and base of said transistor, said second capacitance and second inductance having values such that the inherent capacitance between the collector and base of said transistor forms an appreciable part of the reactance of the resonant tank circuit means, and means to apply a modulating signal to said transistor to simultaneously vary the average emitter current of said transistor and the average collector-to-base voltage of said transistor.

3,855,554
OSCILLATOR CIRCUIT FOR TESTING INDUCTORS

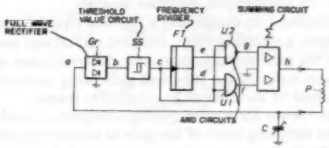
Gerhard Muller, and Rolf Bondiek, both of Backnang, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Oct. 30, 1973, Ser. No. 411,173

Claims priority, application Germany, Oct. 31, 1972, 2253296

Int. Cl. H03b *5/08*

U.S. Cl. 331—167 **2 Claims**



1. In a generator arrangement for producing electrical oscillations for testing an inductor and measuring its quality factor, the arrangement including a pair of terminals for connections to such a test inductor, a capacitor connected to one such terminal to be in series with the test inductor, with this series connection of the test inductor and the capacitor determining the frequency of the electrical oscillations, and feedback means having its input connected to such one terminal and its output connected to the other such terminals, the improvement wherein the feedback means comprises: full wave rectifier means connected to said one terminal for rectifying the oscillating voltage appearing across said capacitor; threshold value means connected to the output of said rectifier means for producing rectangular pulses in response to the peaks of the output signal emitted by said rectifier means; frequency divider means connected to the output of said threshold value means for dividing the frequencies of the rectangular pulses in half and producing first and second output signals having opposite phases with respect to each other; an AND circuit having its first input connected to said frequency divider means to receive the first output signal and its second input connected to the output of said threshold value means; a negated AND circuit having its first input connected to said frequency divider means to receive the second output signal and its second input connected to the output of said threshold value means; and summing means connected to the outputs of said AND circuit and said negated AND circuit for summing the output signals of said circuits, said summing means having its output connected to said other terminal.

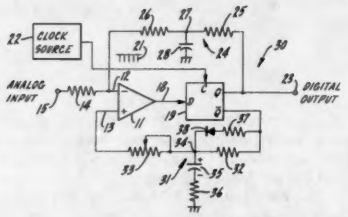
3,855,555
DELTA MODULATOR HAVING LOW-LEVEL RANDOM NOISE CHARACTERISTIC

Mahlon D. Burkhard, Hinsdale, and Richard W. Peters, Algonquin, both of Ill., assignors to Industrial Research Products, Inc., Elk Grove Village, Ill.

Continuation-in-part of Ser. No. 69,524, Sept. 4, 1970, Pat. No. 3,681,531. This application Aug. 25, 1972, Ser. No. 283,925

Int. Cl. H03k *13/22, 7/00*

U.S. Cl. 332—11 D **6 Claims**



1. A delta modulator, suitable for audio signal processing, which provides a subjectively tolerable low-level random idling noise in the demodulated output of the modulator, comprising:

high-gain comparator amplifier means having two inputs and an output;

input means for applying an initial analog signal to one input of the comparator amplifier means;

a sampling gate comprising a flip-flop circuit having a main input, a sampling input, and first and second outputs, one of the gate outputs comprising the modulator output, the main input of the sampling gate being connected to the output of the comparator amplifier means;

clock means for applying a high-frequency clock signal to the sampling input of the gate to control actuation of the gate between two alternate operating conditions and generate two output pulse signals of inverse polarity at the gate outputs;

a principal integrating negative feedback circuit, having a short time constant, connected from one output of the sampling gate to one input of the comparator amplifier means, for integrating one pulse signal from the gate to develop a replica analog signal and for applying that replica signal to the comparator amplifier means in bucking relation to the initial analog signal;

and a self-bias feedback circuit, comprising an integrating circuit having a long time constant, connected from one output of the sampling gate to one input of the comparator amplifier means, for applying a self-bias reference to the comparator amplifier means, the self-bias feedback circuit also transmitting a negative feedback A.C. signal of limited amplitude to introduce a limited broad-band noise content into the output signal of the modulator;

one of the feedback circuits being connected to the other input of the comparator amplifier means.

3,855,556
SELECTABLE FREQUENCY BANDPASS FILTER

Clinton S. Hartmann, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 2, 1973, Ser. No. 347,115

Int. Cl. H03h *9/26, 9/30, 9/32*

U.S. Cl. 333—72 **8 Claims**

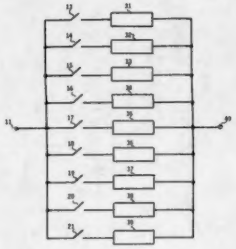
1. A selectable frequency filter comprising:

substrate means defining at least a substrate surface layer of piezoelectric material capable of propagating acoustic surface waves,

a plurality of electrical filters disposed on the piezoelectric surface of said substrate means,

each of said electrical filters comprising input and output acoustic surface wave transducers so constructed and arranged to provide a frequency response including at least one relatively narrow passband centered at a frequency chosen from a pre-determined set of discrete frequencies and effectively zero transmission elsewhere, the frequency responses of the respective input and output acoustic surface wave transducers comprising the individual electrical filters differing from each other,

at least one set of input and output acoustic surface wave transducers providing a frequency response including a plurality of relatively narrow passbands centered at a plurality of frequencies chosen from the pre-determined set of discrete frequencies wherein at least one of said



plurality of relatively narrow passbands coincides with a relatively narrow passband included in a frequency response of another set of input and output acoustic surface wave transducers,

switching means operably associated with each of said plurality of electrical filters and being selectively closed to connect particular electrical filters in parallel between the input and output of the selectable frequency filter,

the particular electrical filters connected in parallel including at least two filters having coinciding relatively narrow passbands included in the frequency responses thereof such that reinforcement of duplicated relatively narrow passbands occurs to provide a resultant frequency response having a dominant relatively narrow passband at one frequency of the pre-determined set of discrete frequencies at which the selectable frequency filter passes energy more readily than at any other frequency.

3,855,557
TEST TRIP MEANS FOR CIRCUIT BREAKER

Carl E. Gryctko, Haddon Heights, N.J., assignor to I-T-E Imperial Corporation, Spring House, Pa.

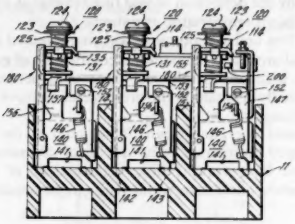
Filed Dec. 3, 1973, Ser. No. 421,032

Int. Cl. H01h *71/74*

U.S. Cl. 335—42 **8 Claims**

1. A multipole circuit breaker including cooperating contacts for each pole thereof; releasable contact operating means for opening and closing said cooperating contacts; latch means for maintaining said operating means in a latched position; a common trip bar extending between all poles of said circuit breaker, individual fault current responsive means for each pole of said circuit breaker any one of which is operable, upon sensing a predetermined fault current condition, to act through said trip bar to release said latch means thereby releasing said operating means and opening said cooperating contacts; adjusting means for calibrating said fault current responsive means; housing means wherein the elements previously recited are disposed; said adjusting means including a

portion accessible for pivotal operation from outside of said housing to calibrate said fault current responsive means; said



portion when in a predetermined angular position being selectively operable to release said latch means.

3,855,558

ELECTRICAL CONTACT ATTACHMENT

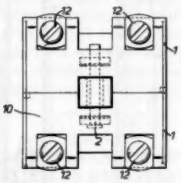
William Herbert Hayward, Bedford, England, assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 11, 1974, Ser. No. 460,071

Claims priority, application Great Britain, Apr. 18, 1973, 18839/73

Int. Cl. H01h *67/02*

U.S. Cl. 335—132 **6 Claims**



1. An electrical contact unit for attachment to an electromagnetically operated switch, said contact unit comprising:

a. a housing divided into parts;

b. at least one leg depending from each housing part;

c. a hooked end formed on each leg, for engagement of the contact unit with a complementary formation on the switch;

d. resilient means holding the two housing parts together and permitting partial separation of the two housing parts against the resilience of said means whereby the contact unit is snap-engageable with said complementary formation;

e. relatively movable contact members in the housing; and

f. an operating member for said contact members.

3,855,559

MAGNETIC POSITION DETECTORS, NOTABLY LEVEL DETECTORS

Jean Paul Lenseigne, Enghien-les-Bains, France, assignor to Societe Anonyme Petrole Service, Paris, France

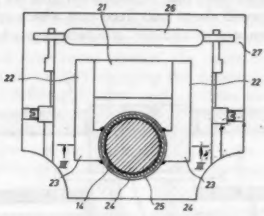
Filed Dec. 3, 1973, Ser. No. 420,934

Claims priority, application France, Dec. 5, 1972, 72.43172

Int. Cl. H01h *36/00*

U.S. Cl. 335—207 **11 Claims**

1. A magnetic detection device for detecting the position of a movable member comprising a nonmagnetic tube, a piece of magnetic material operatively connected to said member and movable within said tube in accordance with the movement of said member, a detector unit situated external to said tube comprising a permanent magnet the poles of which are situated on either side of said tube and a ring of magnetic material



surrounding said tube and integral with the poles of said magnet, and a flexible knife switch located adjacent said magnet.

3,855,560

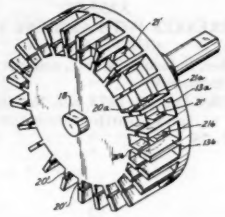
MULTI POSITION ROTARY DETENT DEVICE

Frank L. Ward, Kensington, N.H., assignor to Clarostat Mfg., Co. Inc., Dover, N.H.

Filed May 14, 1973, Ser. No. 360,138

Int. Cl. H01f *7/02*

U.S. Cl. 335—302 **8 Claims**



1. A multi position rotary detent device including in combination a first rotary member, a plurality of circularly arranged first pole pieces of said first rotary member, said first pole pieces being formed of a magnetic material, a second rotary member rotatably supported with respect to said first rotary member, a magnet of said second rotary member having first and second surfaces respectively oriented magnetic north and magnetic south, a first pole member of said second rotary member adjacent said first surface and having second pole pieces, a second pole member of said second rotary member adjacent said second surface and having third pole pieces, said pole members being in fixed relation with said magnet and formed of a magnetic material, said second and third pole pieces and said first pole pieces projecting toward each other, and means for relatively rotating said first and second rotary members whereby the relative angular position of said first rotary member with respect to said second rotary member determines the magnetic flux paths between selected second and third pole pieces and selected said first pole pieces.

3,855,561

HIGH FREQUENCY COIL HAVING AN ADJUSTABLE FERRITE POT CORE

Paul Gottschalt, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 18, 1972, Ser. No. 315,869

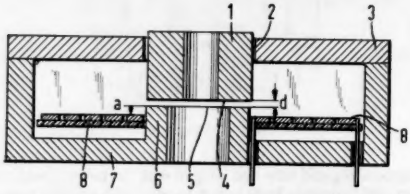
Claims priority, application Germany, Dec. 29, 1971, 7149293; Apr. 14, 1972, 2218135

Int. Cl. H01f *21/06*

U.S. Cl. 336—83 **5 Claims**

1. High frequency coil apparatus, comprising: a variable air gap pot core including a first core member having a bore

therein, a second core member having a fixed part with a surface facing said bore, and a movable core member disposed in and movable in said bore and having a surface which with the surface of said fixed part defines a variable air gap; and a planar coil disposed about said fixed part which comprises a plurality of concentric circular conductors each having a



separation therein, and a plurality of radially extending conductor sections, connecting adjacent circular conductors at respective separations and wherein the plane of said coil is parallel to said surface of said fixed part and is disposed at a distance from said surface of said fixed part in the range of from 1/6 of the maximum length to one-half of the minimum length of the variable air gap.

3,855,562

CIRCUIT BREAKER WITH AMBIENT TEMPERATURE COMPENSATION

Hackchan Rhee, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 23, 1973, Ser. No. 408,303
Int. Cl. H01h *71/16, 61/00*
U.S. Cl. 337—75 **3 Claims**

1. In a circuit breaker of the type including a pair of cooperating electrical contacts, an operating means for moving said contacts to their engaged and disengaged positions, responsive to a predetermined fault, an overload responsive trip means for sensing the occurrence of said predetermined fault and initiating movement of said operating means to the contact disengaged position, said trip means including a first bimetal in the current flow path of said circuit breaker and operative to deflect due to the heat generated thereby to actuate said operating means towards the contact disengaged position when the current flow reaches said predetermined fault, and a housing for locating and enclosing the afore-mentioned circuit breaker components, the improvement therewith of:

a second bimetal within said housing, and proximately placed with respect to said first bimetal to be substantially similarly affected thereas by variations in ambient temperature in said circuit breaker which tend to deflect said first bimetal independent of the current flow therethrough;

said second bimetal being also operative to deflect due to the heat generated by said variations in ambient temperature, but in a direction to oppose the actuation of said operating means towards the contact disengaged position caused by the deflection of said first bimetal as a result of said ambient temperature variations;

with said first and second bimetals being selected of cross-sectional areas and temperature coefficients of expansion so as to maintain the physical separations between them substantially constant in the presence of ambient temperature changes;

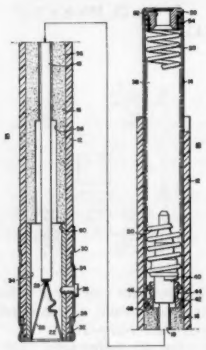
whereby said operating means is actuated to the contact disengaged position upon the sensing of said same predetermined fault current flow, independent of ambient temperature conditions within said circuit breaker.

3,855,563

CIRCUIT INTERRUPTER

Frank L. Cameron, Irwin, and Harold L. Miller, West Elizabeth, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 21, 1973, Ser. No. 418,131
Int. Cl. H01h *85/02*
U.S. Cl. 337—221 **5 Claims**

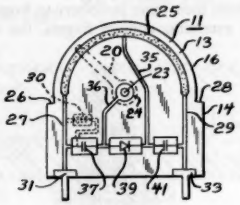


1. A high voltage circuit interrupter comprising a tubular insulating casing, a body of arc-extinguishing material disposed inside of and spaced from the ends of the casing and having an opening extending axially therethrough, an elongated conducting member axially movable within the opening, terminal means at one end of the casing comprising a tubular conductor within the tubular insulating casing and in the spacing between the end of the body of arc-extinguishing material and said end of the casing, a ferrule on the exterior of the end portion of the casing, fusible means extending between the end of said member and the tubular conductor and comprising an end portion secured between the casing and the ferrule, the ferrule being form-fitted to the casing end portion for retaining the fusible means in place, a tubular conducting casing seated within the other end of the tubular insulating casing and extending outwardly therefrom, an annular conductor between the tubular conducting casing and the elongated conductor member, the tubular conducting member being form-fitted to the periphery of the annular conductor, and a helical spring between the elongated conductor member and the end of the tubular conducting member remote from the tubular insulating casing effective to move the elongated conducting member away from the fusible means upon fusion of the fusible means.

3,855,564
VOLTAGE DIVIDER ASSEMBLY WITH THICK FILM RESISTANCE ELEMENTS

Christ J. Dumas, Forest View, Ill., assignor to American Plasticraft Company, Chicago, Ill.

Filed July 5, 1973, Ser. No. 376,699
Int. Cl. H01c *9/02*
U.S. Cl. 338—48 **4 Claims**

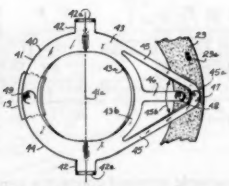


1. A variable voltage divider comprising an electrically non-conductive substrate, a plurality of conductive terminations supported on a surface of said substrate, a resistive path supported on said surface and electrically connected at its ends to respective conductive terminations, a first conductive connector supported on said surface and having one end electrically connected to a intermediate point on said resistive path, a center conductive collector supported on said surface, adjusting means supported for movement relative to the substrate, a conductive contactor constrained to move with the adjusting means to wipingly engage the resistive path and the conductive collector, a second conductive connector having one end connected to the collector, rectifier means having one electrode connected to said first conductive connector and the other electrode connected to the conductive contactor and the collector to thereby provide a variation in the output voltage and a feedback control voltage bias.

3,855,565
VARIABLE RESISTANCE CONTROL WITH DIFFERENTIALLY RESILIENT CONTACTS

James H. Robinson, and John D. Van Benthuysen, both of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Apr. 2, 1974, Ser. No. 457,182
Int. Cl. H01c *9/02*
U.S. Cl. 338—171 **9 Claims**

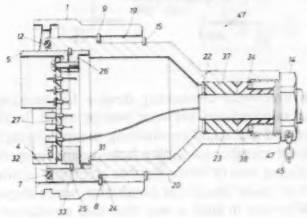


1. A variable resistance control comprising a resistance element, a collector in spaced relationship to the resistance element, an electrically conductive contactor engaging the resistance element and the collector, means for moving the contactor intermediate the ends of the resistance element, said contactor comprising a circular ring, a pair of pivots extending outwardly from the body portion and pivotally supporting the contactor against the resistance element and the collector, each of the pivots being provided with an upturned end constraining the contactor to move with the above mentioned means, the circular body portion being creased through its pivots and defining a pair of semicircular sections, each of the semicircular sections of the circular body portion being preformed and defining an obtuse angle therebetween, a pair of outer arms extending tangentially outwardly from one of the semicircular sections and converging toward each other and joined together at the extremities, an outer contact carried by the arms, an inner arm extending radially outwardly from the one of the semicircular sections toward the outer contact, an inner contact carried by the end of the inner arm, and spaced from outer contact, the outer contact and the inner contact wipably engaging the resistance element, the outer arms defining an acute angle, and the inner arm bisecting the acute angle, the length of the outer arms being greater than the length of the inner arm resulting in a different rate for the inner arm and the outer arms, and a main contact carried by the circular body portion and wipably engaging the collector.

3,855,566
HERMAPHRODITIC CONNECTOR FOR SEISMIC CABLES

Jacob C. Richardson, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Continuation of Ser. No. 177,718, Sept. 3, 1971,. This application Sept. 19, 1973, Ser. No. 398,715
Int. Cl. H01r *25/00*
U.S. Cl. 339—49 R **4 Claims**



1. A hermaphrodite connector for multiconductor seismic cables, each half of the connector being identical and comprising:

a cylindrical body member having one end of reduced diameter for receiving said seismic cable and the other end of enlarged diameter for mounting a connector panel;

a first seal means, said first seal means being disposed in said one end of the body member and adapted to seal said body member to the outer surface of the seismic cable;

a hermaphrodite contact panel having a plurality of male and female contact pins extending from said panel, said contact panel being mounted in said other end of said body member;

a short guide member, said short guide member being mounted in the other end of said body member to surround a portion of the contact, said short guide member having a length that extends beyond said male and female contact pins;

a long guide member, said long guide member being mounted in the other end of said body member and disposed to surround an additional portion of said contact panel, said long guide member having a length that extends beyond said male and female contact pins;

an insert member, said short and long guide members and said contact panel being mounted on said insert member, said insert member having alignment means for engaging co-operating alignment means formed on the inner surface of said enlarged end of said body member, and means for retaining said insert member in said body member with said alignment means engaged;

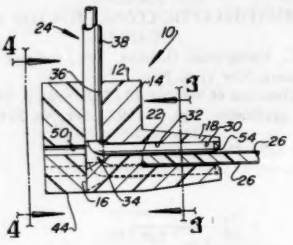
a removable collar having both interrupted male and female threads in diametrically opposed relationship, said collar being disposed to surround the other end of said body; and

retaining means, said retaining means operably engaging both said body and said collar to retain said collar on said body while permitting limited axial movement for engaging said interrupted male and female threads.

3,855,567
ELECTRICAL CONNECTOR AND METHOD FOR MAKING AN ELECTRICAL CIRCUIT

William J. Harms, Nunica, and Fred W. Loy, Whitehall, both of Mich., assignors to Gardner-Denver Company, Quincy, Ill.

Filed Mar. 13, 1973, Ser. No. 340,781
Int. Cl. H05k *1/07*; **H01r** *13/08*
U.S. Cl. 339—61 M **2 Claims**



1. An electrical connector device for making separable electrical connections between one or more flexible conductor wires and electrical conducting means characterized by:

a support member including hole means formed therein for receiving one or more flexible electrical conductor wires, one or more electrical conductor wires disposed in said hole means in such a way that said conductor wires each have an uninsulated end portion the shape of which is substantially unaltered from the as formed condition supported by said support member for separable and electrically conductive engagement with said conducting means;

said connector device includes groove means intersecting said hole means in said support member for supporting insulated portions of said conductor wires which are bent substantially perpendicular to said end portions;

said support member includes separate projecting portions defining one of a pair of spaced apart faces forming slot means for receiving a connector member including said conducting means, at least one of said separate projecting portions including hole means opening laterally to said one face for receiving and supporting an uninsulated end portion of a conductor wire for electrical conductive engagement with said conducting means; and,

a cover member releasably engageable with said support member for retaining said conductor wires in said hole means so that said end portions of said conductor wires can be inserted in and removed from said support member without substantially altering the shape of said end portions, and said conductor wires together with said support member and said cover member can be separated from said conducting means.

3,855,568
FORCED CONTACT ELECTRICAL CONNECTOR

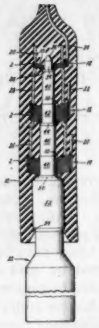
Peter R. Cochrane, Kingston, Mass., assignor to General Electric Company, Philadelphia, Pa.

Filed Oct. 10, 1973, Ser. No. 405,064
Int. Cl. H01r *9/06*
U.S. Cl. 339—95 R **3 Claims**

1. An electrical connector comprising a plug and receptacle in which

a. the plug comprises a first circularly cylindrical portion including a contact surface and a second circularly cylindrical portion positioned contiguous and concentric with said first portion and having a greater diameter than said first portion, the second portion thus providing a protruding shoulder of greater diameter than the contact surface contiguous to the contact surface and associated therewith;

b. the receptacle comprises a stack of annular dished washers slotted from their inner periphery to from a plurality of centrally extending contact fingers, the said dished



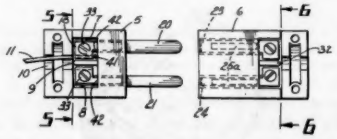
washers in the stack being stacked against one another with their contact fingers extending in the direction from which the plug is to be inserted;

c. retaining means are provided to retain the plug in the receptacle with the protruding shoulder displacing the contact fingers into contact with the associated contact surface of the plug.

3,855,569
THERMOCOUPLE TERMINAL CONNECTOR

John Tymkewicz, c/o Marlin Mfg. Corp., 12404 Triskett Rd., Fairview Park, Ohio 44111

Filed May 7, 1973, Ser. No. 357,786
Int. Cl. H01r *7/20*, *19/02*
U.S. Cl. 339—176 T **5 Claims**



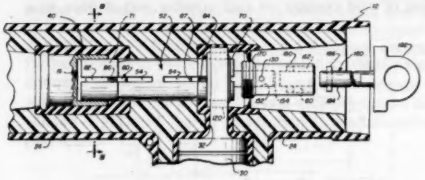
1. In thermocouple terminal connector construction of the class described in combination, a male contact unit and a female contact unit, a body for each unit, each said unit comprising an upper and lower part, each of said parts including a contact having a contact portion and a connector section spaced apart along the longitudinal axis of said contact, said contact portions being formed to effect electrical contact between the said portions of connected units, said connector section of each unit including a stationary area and an elongated movable area, said movable area being given a partial twist with respect to said longitudinal axis to position at least a part of said movable area away from said stationary area to effect the connecting of the unit with a unitary conductor inserted between said areas, and means to move said movable area of each unit from the twisted position into contact with such conductor and maintain the same so connected in electri-

cal contact in the position as inserted solely by actuation of the means.

3,855,570
ELECTRICAL INTERCONNECT DEVICE

Allen Herbert Fischer, Affton, Mo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 2, 1972, Ser. No. 293,925
Int. Cl. H01r *7/08*
U.S. Cl. 339—267 **14 Claims**

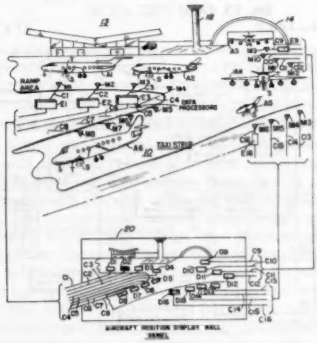


1. An electrical distribution connector interconnecting a first electrical conductor to a second electrical conductor in a connection within an insulating housing, the connection being capable of carrying elevated currents, and in which there are members having spacedapart walled openings of regular configuration connected to each of said conductors, the invention comprising a single sleeve member, including tubular wall sections, said sleeve member inserted axially into both said openings, means for expanding the wall of said sleeve member radially at said separate sections thereof at essentially the same time to firmly engage both walled openings in compressive surface contact between said member sections and the walls of said openings, means accessible from an end of said sleeve for actuating said expanding means and said sleeve member completing a continuous conductive path between said sections for completing a connection between said first and said second conductors.

3,855,571
AIRCRAFT GROUND TRAFFIC CONTROL SYSTEM

Frank Massa, Cohasset, Mass., assignor to Massa Corporation, Hingham, Mass.

Filed Apr. 13, 1972, Ser. No. 243,656
Int. Cl. G08g *5/00*
U.S. Cl. 340—26 **6 Claims**

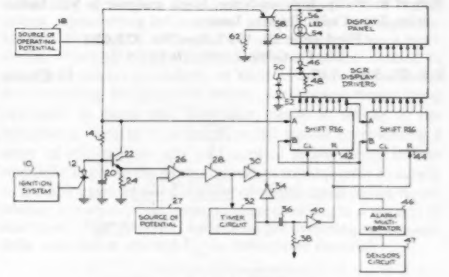


1. A system for automatically indicating and continuously displaying the locations of individual airplanes while they are on the ground at an airport, said system comprising a transmitting transducer means mounted on each of said airplanes for sensing a coded aircraft identification signal individually associated with each of said airplanes, power activating means for operating said transmitting transducer to send said signal, a plurality of receiving transducer means arranged in a fixed spatial pattern on the airfield, a plurality of communication link means, a plurality of recognition circuit means operated responsive to said identification signal, each of said communication link means connecting a receiving transducer to a corresponding recognition circuit, a plurality of indicator means operated responsive to said identification signals for indicating and continuously displaying both the spatial relationships and the identity of the plurality of receiving transducer means, each of said recognition circuit means being connected to an individually associated indicator means, and means for activating said associated indicator means when the associated receiving transducer is receiving a coded identification signal from an airplane.

3,855,572
TACHOMETER

John M. Olson, 1513 7th St., Port Hueneme, Calif. 93041

Filed Apr. 2, 1973, Ser. No. 347,230
Int. Cl. B60q *3/04*
U.S. Cl. 340—52 F **10 Claims**



1. A tachometer for indicating RPM of an engine from engine revolution representative signals generated by said engine comprising:

a display comprising light-emitting diode means,

timer means for establishing a timer pulse signal having a predetermined duration,

means responsive to said engine revolution representative signals occurring during said timer pulse signal duration, for illuminating said light-emitting diode means to represent the RPMs of said engine, and

means for momentarily quenching said light-emitting diode means at the ending of one of said timer pulse signals.

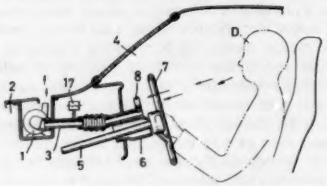
3,855,573
APPARATUS FOR PREVENTING A DRUNKEN DRIVER FROM OPERATING A MOTORCAR

Soichiro Honda, and Yasuo Satoh, both of Tokyo, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1972, Ser. No. 300,997
Int. Cl. B60r *27/00*
U.S. Cl. 340—53 **8 Claims**

1. Apparatus for preventing operation of a vehicle by a drunken driver, the vehicle having an electrical power source and an ignition switch, said apparatus comprising a suction pipe having an inlet end which opens into the interior of a passenger compartment of the vehicle and faces the driver's seat of the vehicle, said suction pipe having an opposite end remote from said inlet end, a suction motor connected to said opposite end of said pipe, said suction motor being electrically connected to the electrical power source of the vehicle through the ignition switch whereby the suction motor is operable independently of the operation of the engine of the vehicle, detecting means for detecting the alcohol content in

the air flowing in the suction pipe, further means coupled to the detecting means to render the vehicle inoperative when the detecting means senses the presence of alcohol in excessive amount and means for sensing pressure change in said suction pipe for rendering the vehicle inoperative upon excess pressure change.



3,855,574

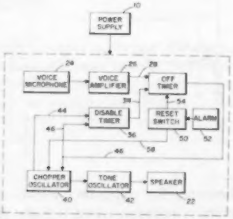
VOICE OPERATED ALARM SYSTEM

Robert E. Welty, Independence, Iowa, assignor to Vox Industries, Inc., Cedar Rapids, Iowa

Filed June 25, 1973, Ser. No. 373,024

Int. Cl. G08b *21/00;* **H01h** *35/24*

U.S. Cl. 340—148 **11 Claims**



1. A voice-operated alarm system comprising, alarm means for producing an audible alarm, actuating means for actuating said alarm means, detection means for picking up a sound within the normal range of the human voice and converting said sound into an output signal, means coupling said output signal to said alarm means so as to shut off said audible alarm, timing means coupled to and actuated by said output signal to prevent said audible alarm from sounding for a predetermined time interval after which said alarm will again start sounding, and means for selectively disabling said timing means and output signal to prevent said alarm from sounding until actuated by said actuating means.

3,855,575

ULTRASONIC REMOTE CONTROL RECEIVER

Horst Leuschner, Dallas, Tex., and Bruno Gerhard Viereck, Marzling, Germany, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 24, 1973, Ser. No. 354,025

Claims priority, application Germany, May 3, 1972, 2221559

Int. Cl. H04q *9/00;* **H04b** *1/06*

U.S. Cl. 340—167 R **9 Claims**

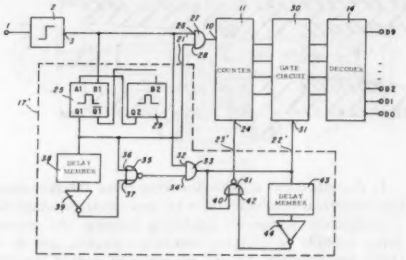
1. An ultrasonic remote control receiver for applying a control signal to a selected one of a plurality of control channels in response to and dependent on the frequency of a received ultrasonic signal comprising:

a. pulse forming means producing pulses at a frequency directly related to the frequency of a received ultrasonic signal;

b. counter means for counting pulses produced by said pulse forming means and providing a digital indication of the count when activated, said digital indication apearing as a combination of signals on a plurality of counter output lines less in number than said plurality of control channels;

c. decoder means for activating one of a plurality of decoder output lines comprising said plurality of control channels in dependence on the digital indication of count receiver at its input:

d. transfer means for periodically applying the count indication of said counter on said counter output lines to a corresponding plurality of lines comprising the input of said decoder; and,



e. sequence control means for

i. activating said counter for a predetermined period of time in response to the production of pulses by said pulse forming means;

ii. activating said transfer means to apply said indication of count to said corresponding plurality of lines of said decoder means at the end of said predetermined period; and

iii. thereafter resetting and reactivating said counter means.

3,855,576

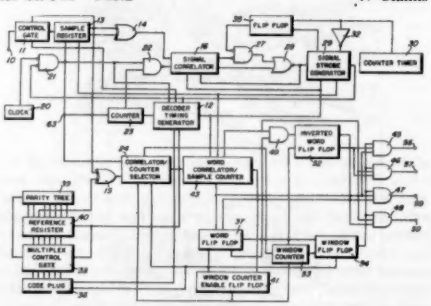
ASYNCHRONOUS INTERNALLY CLOCKED SEQUENTIAL DIGITAL WORD DETECTOR

William V. Braun, Lauderhill; Eugene J. Bruckert, Plantation; Gerald L. Giacomino, Coral Springs, and Phillip Partipilo, Lauderdale Lakes, all of Fla., assignors to Motorola, Inc., Chicago, Ill.

Filed May 29, 1973, Ser. No. 364,988

Int. Cl. G06f *7/02, 15/34*

U.S. Cl. 340—146.2 **47 Claims**



1. A detector for detecting first and second predetermined digital words within a train of signals wherein the digits in said words each have a predetermined time period, said detector including in combination; clock means for developing a plurality of first clock pulses during the interval of one of said digit time periods, sample and storage means for receiving said

train of signals, said sample and storage means being coupled to said clock means and responsive to each of said first clock pulses to sample the signals in said train of signals coupled thereto and store a digital signal corresponding to said sampled signal, memory means for storing digital words corresponding to said predetermined digital words, and comparison means coupled to said sample and storage means and said memory means and operative between said first clock pulses to compare said digital signals in said sample and storage means with a first digital word in said memory means, said comparison means being operative in response to a correlation between said digital signals in said sample and storage means and said first digital word to count a first time period at least as long as the time period of the second digital word and develop a first timing signal, said comparison means being further operative in response to said first timing signal to compare the digital signals in said sample and storage means with the second digital word in said memory means and develop a detection signal in response to a correlation therebetween.

3,855,577

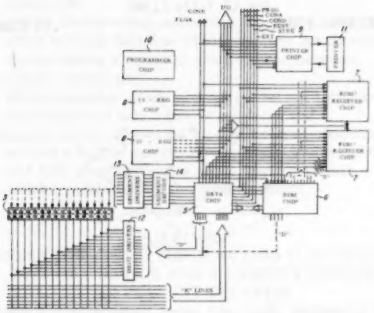
POWER SAVING CIRCUIT FOR CALCULATOR SYSTEM

Jerry L. Vandierendonck, Santa Cruz, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 11, 1973, Ser. No. 368,779

Int. Cl. G06f 1/00

U.S. Cl. 340—172.5 **7 Claims**



1. In a data processing system of the type having an instruction memory for storing and providing instruction words, an arithmetic logic unit and a control unit therefor for processing data in response to instruction words and system timing, data storage for storing data, and means for communicating the stored data to said arithmetic logic unit in response to instruction words, and further having decoder means coupled to the arithmetic logic unit, said decoder means having a plurality of input lines and a plurality of output lines disposed to form a matrix, said output lines coupled to a reference potential for establishing a first logic voltage level thereon, said decoder means further having a first plurality of switching means arrayed at the intersections of said matrix for switching the voltage level on selective output lines from said first logic level to a second logic voltage level in response to signals during a first period on said input lines, the improvement comprising a second switching means for periodically coupling said reference potential to said output lines in response to a gating signal, and means coordinated with said system timing for selectively generating said gating signal to said switching means, whereby the non-selection of said potential inhibits any output signals from said decoder so as to conserve system power.

3,855,578

HOLOPHONE INFORMATION STORING AND/OR PROCESSING DEVICE

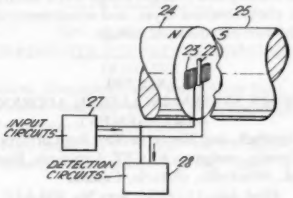
Christopher John Hamilton Watson, Oxford, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 8, 1971, Ser. No. 121,920

Claims priority, application Great Britain, Mar. 11, 1971, 11777/70

Int. Cl. G11c 13/00

U.S. Cl. 340—173 NC **7 Claims**



1. A holophone information storing and processing device comprising generator means for generating coded signal pulses, representing information, in a form for causing a systematic disturbance to the motion of elements within a holophone material, which elements possess or are caused to acquire a natural periodicity in their motion, control means for controlling the generator means, said control means being operative to cause said generator means to supply to the holophone material a series of coded signals representing a store of information and said control means being further operative to cause the generator means subsequently to supply to the hologram material a series of coded signal pulses representing a portion of information corresponding to a portion of said store of information, and means for detecting subsequent echo waveforms emitted by the holophone material.

3,855,579

METHOD OF USING AN OPTIC RELAY COMPRISING AN ELEMENT OF AN ELECTRO-OPTICAL MATERIAL AND A PHOTOSENSITIVE ELEMENT

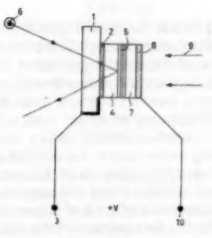
Michel Grenot, Brunoy, and Jean Pergrale, Paris, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 15, 1973, Ser. No. 323,848

Claims priority, application France, Jan. 14, 1972, 72.01326

Int. Cl. G11c 13/04

U.S. Cl. 340—173 LM **2 Claims**



1. A method of using an optic relay in conjunction with at least a first source of light radiation having a first frequency, means for projecting the said radiation, at least a second source of light radiation having a second frequency, polarization and projection means from said second light radiation on an optic image relay constituted by an evacuated space having at least one window which is transparent to the said light

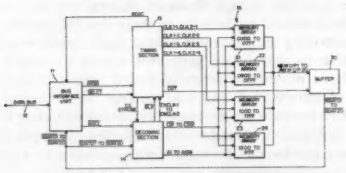
radiation, a layer which is photosensitive to the said first radiation, a plate having an electro-optic effect maintained at a temperature near its Curie point and presenting a variable double refraction as a function of a potential difference existing between its faces, a first electrode which is electrically conductive and optically transparent to the said second light radiation being disposed against the said plate and a second electrode being placed on the opposite side in the proximity of the said plate, the method comprising displaying an image of electric charges while projecting an image on the photosensitive layer and in the presence of a voltage V between the electrodes, erasing said charges image while illuminating uniformly the photosensitive layer, and simultaneously applying between the two electrodes a voltage $-V'$.

3,855,580

MEMORY SYSTEM INCLUDING ADDRESSING ARRANGEMENT

John T. Lighthall, and Harry A. Toy, both of Brockville, Ontario, Canada, assignors to GTE Automatic Electric (Canada) Ltd., Brockville, Ontario, Canada

Filed Jan. 11, 1974, Ser. No. 432,622
Int. Cl. G11c *7/00, 17/00*
U.S. Cl. 340—173 R **5 Claims**



1. A memory system comprising

several arrays of memory elements, each memory element having the capacity for storing a quantity of word segments, each memory element having word segment address input connections for selectively addressing each word segment of said quantity as determined by signals applied thereto, a number of output connections equal to the number of bits of a word segment, a memory element select connection for enabling the memory element in response to a signal applied thereto, and a clock input connection, each memory element being operable in response to a signal at the clock input connection during a signal at the memory element select connection to read out at the output connections the bits of the word segment addressed by the signals at the address input connections;

address receiving means for receiving address information, said address information having a first portion designating a particular one of the word segments of the quantity of word segments in each memory element, a second portion designating a memory element in each array, and a third portion designating an array;

decoding means including a first means coupled to said address receiving means and to the address input connections of all the memory elements of the system for applying signals to the address input connections to address a particular word segment of each of the memory elements as designated by the first portion of the address information;

said decoding means including a second means coupled to said address receiving means and to the memory element select connections of all the memory elements of the system for applying signals to the memory element select connections to enable a particular memory element of each array as designated by the second portion of the address information;

said decoding means including a third means coupled to said address receiving means and having a number of output connections equal to the number of arrays of the system, said third means being operable to produce a signal at a particular one of its output connections as determined by the third portion of the address formation;

timing means for producing a clock signal during the occurrence of signals from the first, second, and third means of the decoding means; and

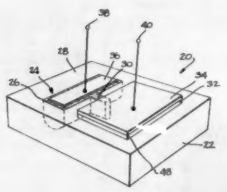
clock gating means coupled to the output connections of the third means of the decoding means and to the timing means and having a number of output connections equal to the number of arrays, each output connection being connected to the clock input connections of all the memory elements of a different one of the arrays, said clock gating means being operable during a clock signal from the timing means to produce a signal at the clock input connections of all the memory elements of a particular array as designated by the third portion of the address information; whereby the bits of a particular word segment of a particular memory element of a particular array as designated by the address information are read out at the output connection of the particular memory element.

3,855,581

SEMICONDUCTOR DEVICE AND CIRCUITS

Richard M. Greene, Audubon, Pa., assignor to MOS Technology, Inc., Valley Forge, Pa.

Division of Ser. No. 213,945, Dec. 30, 1971, abandoned. This application Dec. 26, 1972, Ser. No. 318,456
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 R **12 Claims**

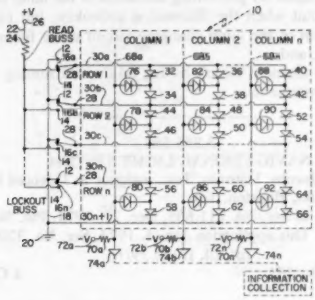


1. A memory circuit comprising a data translating circuit having input and output circuits, a solid state switch comprising a semiconductive wafer including a substrate of one conductivity type and a surface channel of opposite conductivity type defined in a major surface of the substrate, a first terminal defining a low resistance contact to said surface channel, and an insulated electrode, including a dielectric layer and an outer electrode covering, overlying a portion of said major surface of the substrate, a second terminal defining a low resistance contact to said outer electrode covering of the insulated electrode, said insulated electrode and said surface channel having overlapping areas characterized in that substantially zero capacitance is defined between said first and second terminals when said second terminal is at a voltage below a predetermined threshold voltage relative to said surface channel and a coupling capacitance is defined between said first and second terminals when said second terminal is at or above said threshold voltage, means for connecting said second terminal to the input circuit of said data translating circuit, memory means coupled between said second terminal and a point of reference in said circuit, data input means coupled to said second terminal for supplying data signals for storage in said memory means, some of the stored data signals having a value equal to or greater than said threshold voltage, readout pulse source means, and means for connecting said first terminal to said readout pulse source means.

3,855,582
PARALLEL BIASED PHOTODETECTOR MATRIX

Donald L. Roberts, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed June 1, 1973, Ser. No. 366,178
Int. Cl. G11c *11/42*
U.S. Cl. 340—173 LS 6 Claims



1. A parallel biased photoconductor cell comprising: first and second row conductors;

a first source potential connected to said first row conductor;

a second source of potential connected to said second row conductor;

a pair of diodes series connected in forward-biased disposition between said first and second row conductors, said diodes having a common junction therebetween;

a column conductor;

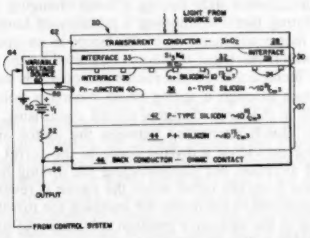
a photoconductor diode connected between said column conductor and said common junction; and

detector means connected to said column conductor for sensing a flow of current through said column conductor and said photoconductor diode and for issuing a signal which is a function of the sensed current.

3,855,583
CONDUCTOR-INSULATOR-JUNCTION (CIJ) OPTICAL MEMORY DEVICE AND A MEMORY SYSTEM DEPENDENT THEREON

Richard A. Gudmundsen, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 4, 1973, Ser. No. 366,829
Int. Cl. G11c *11/40, 11/42*
U.S. Cl. 340—173 LS 21 Claims



1. A long-term-storage CIJ optical memory device comprising:

transparent conductor means forming a front surface of the device;

insulation means contiguous to the back of the transparend conductor means for storing charges, said insulation means containing a storage interface capable of trapping charges thereat, said insulation means being susceptible to tunneling between storage interface and a back surface of the insulation means;

semiconductor means having a front surface and rectifying junction;

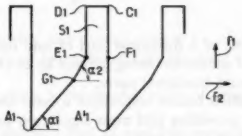
said semiconductor means having an inversion stop grid means associated with the front surface thereof; and

contact means for connecting external voltages to first and second sides of the rectfying junction for biasing the junction.

3,855,584
IMPROVED REGISTER FOR PROPAGATING MAGNETIC DOMAINS

Claude Battarel, Magagnosc, and Jean-Pierre Nori, Toulouse, both of France, assignors to "TECSI" (Techniques et Systemes Informatiques), Paris, France

Filed Sept. 13, 1973, Ser. No. 397,052
Claims priority, application France, Sept. 13, 1972, 72.32441
Int. Cl. G11c *11/14, 19/00*
U.S. Cl. 340—174 MC 5 Claims



1. In a shift register including thin film magnetizable material defining a first zone of relatively low coercivity surrounded by a second zone of relatively high coercivity with said first zone extending in the direction of the axis of relatively difficult magnetization and at right angles to the axis of relatively easy magnetization and being divided from the second zone on respective opposite sides by first and second boundaries, each boundary being formed by periodically repeating divisions comprising a ridge inclined to the longitudinal difficult axis of the register and being connected to an adjacent chamber in the shape of a finger having a direction parallel to the easy axis, the improvement wherein: said ridge has variations in slope between its two ends.

3,855,585
SYSTEM FOR GENERATING A DIGITAL SIGNAL INDICATIVE OF SHAFT POSITION WITH AUTOMATIC ERROR CORRECTION

George H. Stout, Mt. Prospect, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed June 21, 1973, Ser. No. 372,312
Int. Cl. H03k *13/34*
U.S. Cl. 340—347 AD 7 Claims

1. In combination, a data transmission system for providing a digital output signal indicative of the cumulative angular position of a rotatable shaft within a predetermined range of movement in terms of predetermined units of measurement, said digital output signal having a most significant portion indicating the cumulative angular position of said shaft in terms of an integral number of said units of measurement, and a least significant portion indicating only the non-cumulative angular position of said shaft in terms of a fractional portion of one of said units of measurement, said system comprising: means comprising a first encoder responsive to the position of said shaft for providing a first analog data signal indicative of

the cumulative position of said shaft within said range of movement;

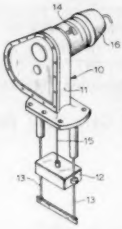
first conversion means responsive to said first analog data signal for producing a first digital data signal indicative of the cumulative position of said shaft in terms of an integral number and a fractional part of said units of measurement, said indication being subject to an error of one of said units of measurement;

means comprising a second encoder responsive to the position of said shaft for providing a second analog data signal indicative of the non-cumulative position of said shaft;

second conversion means responsive to said second analog data signal for producing a second digital data signal indicative of the non-cumulative position of said shaft in terms of a fractional part of said units of measurement, said indication being subject to an error of less than one of said fractional parts;

utilization means responsive to said first digital data signal for providing said most significant portion of said digital output signal and responsive to said second digital data signal for providing said least significant portion of said digital output signal; and

error correction means for modifying said first digital data signal according to the data signals from said first and second encoders to compensate for said one unit error, if present, in said first digital data signal, such that said digital output signal accurately reflects the cumulative position of said shaft.



3,855,586

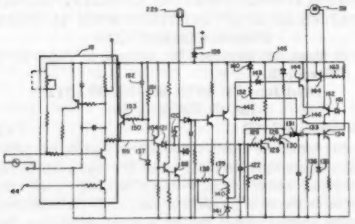
NAVIGATIONAL LIGHT SYSTEM

Thomas A. Jacobs, Houston, Tex., assignor to Tideland Signal Corporation, Houston, Tex.

Division of Ser. No. 211,605, Dec. 23, 1971, Pat. No. 3,781,853. This application Jan. 4, 1973, Ser. No. 320,981

Int. Cl. H05b *39/10*

U.S. Cl. 340—251 **3 Claims**



1. In a navigational light having a timer and a lamp changing circuit and a lamp filament circuit having a series connected power supply and power switch, the improvement in a circuit sensing when the lamp filament in the light is burned out comprising,

switching means for actuating the lamp changing circuit,

a first electrical connection between the timer output and the switching means for supplying a signal to the switching means from the timer preventing actuation of the lamp changing circuit during the timing signal,

a second electrical connection connected between the lamp filament and the power switch for supplying a signal to the switching means when the lamp is not powered by the timing signal for preventing actuation of the lamp changing circuit when the filament is unbroken, but causing actuation of the lamp changing circuit if the filament is broken, and

said lamp filament circuit having no current sensing resistive components.

3,855,587

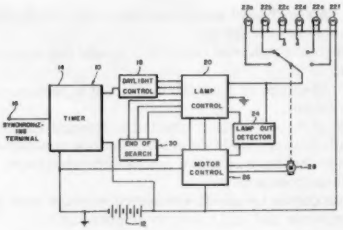
NAVIGATIONAL LIGHT SYSTEM

Thomas A. Jacobs, Houston, Tex., assignor to Tideland Signal Corporation, Houston, Tex.

Division of Ser. No. 211,605, Dec. 23, 1971, Pat. No. 3,781,853. This application Jan. 4, 1973, Ser. No. 320,982

Int. Cl. H05b *39/10*

U.S. Cl. 340—251 **4 Claims**



1. In a navigational light having a power supply, a timer, a lamp-out sensing circuit, a lamp changing circuit having a rotating turret with lamps therein and a power brush which supplies power to contacts connected to the lamps, the improvement in a lamp changing circuit comprising,

switching means connected to and actuated by the lamp changing circuit, said switching means connected between the timer output and the power supply for disabling the timer signal from the lamp when actuated by the lamp changing circuit thereby preventing power from being supplied to the brush while the lamp changing circuit is rotating the turret thereby preventing electrical arcing between the brush and the contacts.

2. In a navigational light having a lamp changing circuit having a rotating turret containing a plurality of lamps and driven by a motor to place one of the lamps in an operative position in which electrical contacts connected to the lamps in the turret include a V-shaped recess and power is supplied to the recesses through a spring brush having a point, the improvement in the lamp changing circuit comprising,

a one-way clutch connected between the motor and the turret for providing a driving force to the turret in the forward direction but disconnecting the driving force of the motor from the turret when the motor is reversed,

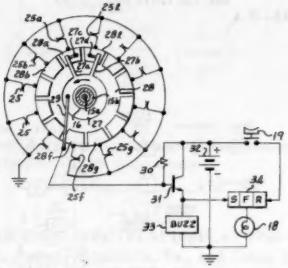
means connected to the motor for indexing the turret when the lamp in the operative position is burned out to place a new lamp in the operative position, and

means for providing a reversing pulse to the motor at the end of the indexing movement for relieving all driving forces of the motor as the one-way clutch is reversed thereby allowing the point of the spring brush to seek the center of the V-shaped recess and accurately align the turret and operative lamp.

3,855,588
TIME REMINDING MACHINE

William J. Buckland, Jr., Merrick, and Kevin C. O'Daly, Levittown, both of N.Y., assignors to Product Potentials Inc., Hicksville, N.Y.

Filed Feb. 5, 1973, Ser. No. 329,852
Int. Cl. G08b 7/00
U.S. Cl. 340—309.4 48 Claims

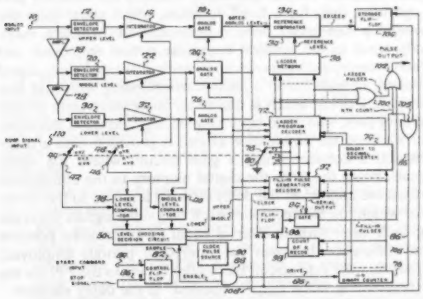


1. A time reminding machine including in combination a plurality of normally-closed manually-operable switches, a time keeping device, an output circuit, and means responsive to the time keeping device for sequentially coupling each switch to the output circuit, said output circuit providing an output signal upon the coupling thereto of a switch which has been manually operated from its normal closed position to an open position.

3,855,589
ANALOG TO DIGITAL CONVERTER WITH VARIABLE QUANTIZATION AND DYNAMIC RANGE

Peter E. Solender, Williamsville, N.Y., assignor to Sylvania Electric Products Inc., Danvers, Mass.

Filed Nov. 25, 1969, Ser. No. 879,709
Int. Cl. H03k 13/04
U.S. Cl. 340—347 AD 10 Claims

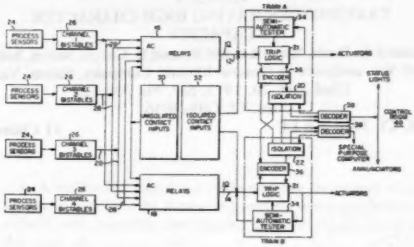


1. An analog to digital converter for quantizing an analog signal into a representative number of output pulses comprising, in combination, an analog signal input terminal, a first signal level comparator having first and second inputs, means coupling said analog signal input terminal to the first input of said first comparator, means for generating successive reference voltage levels in equal logarithmic amplitude steps and applying said reference voltage levels to the second input of said first comparator, means for deriving from said reference generating means converter output pulses corresponding in number to the reference voltage steps generated, means for digitally selectively changing the size of said reference voltage amplitude steps, and means coupled to the output of said first comparator for stopping the generation of reference voltage steps in response to an output signal from said first comparator indicating one of said reference voltage levels exceeds the signal level at the first input of said first comparator.

3,855,590
CYCLIC OR MONITORING SYSTEM FOR DISPLAYING THE OUTPUT OF TWO SUBSTANTIALLY SIMILAR TRAINS OF LOGIC

James A. Neuner, Pittsburgh, Pa., assignor to Westinghouse Electric Corportion, Pittsburgh, Pa.

Filed Apr. 4, 1972, Ser. No. 240,939
Int. Cl. G08b 23/00
U.S. Cl. 340—413 R 7 Claims



1. A cyclic monitoring and display system for alternately displaying the outputs of two substantially identical trains of logic comprising:

a clock for generating a continuous train of logic clock pulses;

a first means for gating a first of said two trains of logic having an input from said clock train and providing an output representative of said first logic train upon the occurrence of each clock pulse;

a second means for gating a second of said two trains of logic having an input from said clock train and providing an output representative of said second logic train intermediate of each clock pulse;

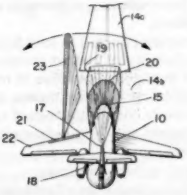
means for "OR'ing" the outputs of said first and second gating means; and

means for displaying said "OR'ed" outputs.

3,855,591
SHADOW ANTENNA

David W. Young, 627 N. Beachwood Dr., Burbank, Calif. 91506

Filed Apr. 27, 1973, Ser. No. 355,019
Int. Cl. G01s 9/02
U.S. Cl. 343—5 LS 7 Claims



1. A method of establishing an elevation relationship to facilitate piloting an aircraft approaching a runway along a precision glide path without the necessity of any ground control approach systems comprising the steps of:

a. positioning a radar antenna on the aircraft at a location such that a physical portion of the aircraft itself intercepts part of the radar beam when the beam is directed towards the runway to thereby cast a shadow of said portion;

b. displaying the resulting radar picture from the antenna on a screen in the pilot's cockpit so that the pilot can visually observe the resulting elevation relationship of the shadow relative to the outline of the runway; and,

c. maneuvering the aircraft to maintain the observed shadow in a known elevation relationship to the runway as the aircraft approaches the runway corresponding to that relationship which results when the aircraft is on said precision glide path, whereby a wholly self-contained system on the aircraft provides the resulting elevational relationship.

3,855,592

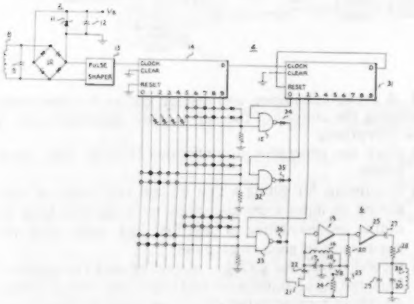
TRANSPONDER HAVING HIGH CHARACTER CAPACITY

Richard K. Davis, Roanoke, and Ronald E. Gareis, Salem, both of Va., assignors to General Electric Company, Salem, Va.

Filed Aug. 20, 1973, Ser. No. 390,122

Int. Cl. G01s *9/56*

U.S. Cl. 343—6.8 LC **11 Claims**



1. A passive transponder for producing a coded signal in response to the reception of an interrogating signal, comprising:

sensing means for developing a voltage in response to the reception of an interrogating signal;

pulse shaping means coupled to said sensing means for producing a train of pulses;

first encoder means coupled to said pulse shaping means and having a plurality of *n* output terminals, said encoder means becoming operative in response to said train of pulses for consecutively energizing at a frequency *f* each of said output terminals in synchronism with the pulses of said train of pulses;

second encoder means coupled to said first encoder means and having a plurality of output terminals, said second encoder means becoming operative in response to pulses produced by said first encoder means at a frequency of *f/n* for consecutively energizing ones of said output terminals in synchronism with the pulses received from said first encoder means;

a plurality of signal utilization means;

circuit means for coupling ones of said output terminals of said second encoder means to ones of said signal utilization means for sequentially enabling said signal utilization means;

second circuit means coupling predetermined ones of said output terminals of said first encoder means to ones of said signal utilization means; and

transmitter means coupled to said signal utilization means for outputting radio-frequency signals modulated to reflect the operation of said signal utilization means.

3,855,593

PULSE RADAR APPARATUS

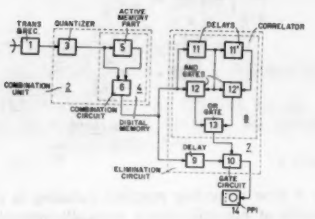
Herman Michel Van Hijfte, and Jan Dirk Ehbel, both of Hengelo, Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo (O), Netherlands

Filed Apr. 17, 1973, Ser. No. 351,838

Claims priority, application Netherlands, Apr. 25, 1972, 7205560

Int. Cl. G01s *9/02, 7/30*

U.S. Cl. 343—7 A **6 Claims**



1. Pulse radar apparatus comprising a transmitter capable to generate a train of transmitter pulses with at least a double stagger of interpulse periods, a receiver, and means with the aid of which video signals of multiple-time-around target echoes are eliminated from a plan position indicator (PPI), wherein said means comprise at least a (first) combination of a quantizer and a digital memory, and also an elimination circuit, the digital memory containing at least one active memory part and a combination circuit, which is fed, directly as well as via said memory part, with the sequential video signals supplied via the quantizer, whereby the memory part is operative only for a fixed duration, which starts from the moment a transmitter pulse is generated and which is maximally equal to the smallest interpulse period employed, and which memory part imposes upon each quantized video signal supplied, in addition to a delay corresponding with said first duration, a delay which is due to an inoperative state of said memory part, said state occurring during said fixed duration, and whereby the elimination circuit is provided with a delay element, a correlator and a gate circuit, where the video signals, being fed from the digital memory to the elimination circuit, are applied to the delay element and also to the correlator which, on the receipt of each two video signals succeeding each other with an interval equal to the smallest possible time difference between the interpulse periods employed, causes that the gate circuit blocks the access to the PPI for the corresponding video signals supplied via the delay element.

3,855,594

MULTIPLE FREQUENCY CONTINUOUS WAVE RADARS

Stephen Charles Lauder Botcherby, London, England, assignor to DECCA Limited, London, England

Filed May 2, 1973, Ser. No. 356,607

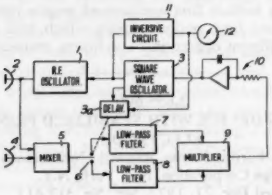
Claims priority, application Great Britain, May 3, 1972, 20636/72

Int. Cl. G01s *9/04*

U.S. Cl. 343—7.5 **10 Claims**

1. A continuous wave radar comprising means for radiating signals of at least two frequencies, means for obtaining Doppler signals associated with each of two transmitted frequencies, multiplying means for receiving the two Doppler signals

and producing a product signal and frequency control means responsive to said product signal for controlling the difference



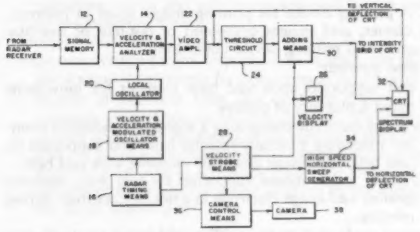
in frequency between the transmitted frequencies to maintain the two Doppler signals in quadrature.

3,855,595

FREQUENCY SPECTRUM DISPLAY FOR RADAR

Garold K. Jensen, Alexandria, Va., and James E. McGeogh, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 16, 1971, Ser. No. 154,232
Int. Cl. G01s *9/44*
U.S. Cl. 343—8 **4 Claims**



1. In a velocity-and-acceleration analyzing radar including means for displaying the velocity parameter of target-return signals, radar timing means, a velocity-and-acceleration analyzer, a video amplifier and a threshold circuit, means for displaying the doppler frequency spectrum of a selected signal comprising:

velocity strobe means triggered by the radar timing means output signal for producing a pulse output which is adjustable as to time of occurrence with respect to the trigger pulse, the stobe pulse also being fed to said means for displaying the velocity parameter so that a particular target may be selected by adjusting the position of the pulse indication to coincide with the target-return indication;

means for generating a high-speed sweep signal, said sweep means being connected to be triggered by the output from said velocity strobe means;

adding means for adding its input signals, said adding means being connected to receive as input signals the thresholded video signal output of said threshold means and the strobe pulse from said velocity strobe means; and

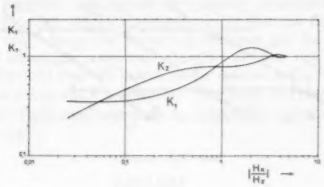
cathode ray tube means (CRT) for displaying the doppler frequency spectrum of said selected target return, said CRT means having the output of said high-speed sweep means connected to its horizontal deflection means, the output of said video amplifier connected to its vertical deflection means and the output of said adding means connected to its beam intensification means.

3,855,596

METHOD FOR THE LOCATION, BY SURFACE WAVES, OF A SOURCE OF ELECTROMAGNETIC RADIATION AND DETERMINATION OF THE POSITION OF A PLACE WITH RESPECT TO ONE OR MORE SOURCES

Jean Duroux, 12 Rye Flatters, Paris 5, France

Filed Nov. 2, 1971, Ser. No. 194,960
Claims priority, application France, Feb. 4, 1971, 71.03769
Int. Cl. G01s *3/02*
U.S. Cl. 343—112 D **3 Claims**



1. A method of locating a source of low frequency electromagnetic radiation by measuring surface waves guided by the subsoil with magnetic and electric field detectors comprising the steps of:

detecting and measuring the values of Hx/Hz for a source that approximates a harmonic magnetic dipole with a vertical axis;

detecting and measuring the values of angular frequency w of the source, the vertical magnetic field Hz and the transverse electrical field Ey;

determining the values of the constant $K_1 = Hz/Ey$ (absolute) $\times$ Ey/Hz (approximate) as a function of the measured values of Hx/Hz measured; and

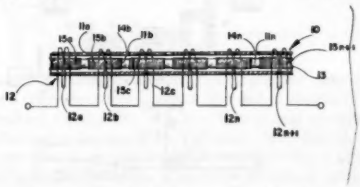
determining the distance of the source from the place of measurement from the Equation $r = 3K_1/\mu w \times Ey/Hz$ where μ is the magnetic permeability of the subsoil.

3,855,597

PHASE-SCANNED RADIATING ARRAY

Robert L. Carlise, Irvine, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 250,945, May 8, 1972,. This application Oct. 12, 1973, Ser. No. 405,992
Int. Cl. H01q *13/10*
U.S. Cl. 343—768 **3 Claims**



1. A phased-scanned radiating array comprising in combination

an end-fed radiating rectangular waveguide having radiating apertures spaced along the length of a side thereof,

a series interconnected plurality of windings wound about said waveguide and axially spaced intermediate successive areas of said radiating apertures, and

a longitudinal ferrite rod inserted within said waveguide, said rod having regularly spaced magnetic and dielectric interruptions in the ferrite material cross-section thereof, the spacing of said interruptions corresponding to that of said apertures,

said interruptions in said ferrite material cross-section being filled with a dielectric material having a dielectric constant substantially different from that of said ferrite.

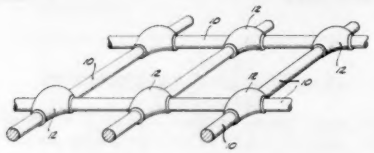
3,855,598
MESH ARTICLES PARTICULARLY FOR USE AS REFLECTORS OF ELECTROMAGNETIC WAVES

Leon B. Keller, Palos Verdes Peninsula, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 83,375, Oct. 23, 1970, abandoned. This application Aug. 29, 1972, Ser. No. 284,508

Int. Cl. H01q *15/20*

U.S. Cl. 343—840 **10 Claims**



1. A folded antenna for radio waves comprising a peripheral support, a non-woven preformed flexible relatively inextensible mesh member secured to said support, said mesh member formed of solid, single-strand fibers intersecting one another and bonded together at each point of intersection, said fibers having a modulus of elasticity exceeding 10×10^6 psi and a yield strength exceeding 32×10^3 psi, said fibers selected from the group of materials consisting of beryllium, aluminum, stainless steel type 304, INVAR 36, CHROMEL R, and alloys of the stainless steel and INVAR type.

3,855,599
APPARATUS FOR RECORDING OPERATIONAL CONDITIONS OF A MOTOR CAR

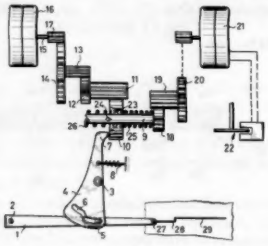
Norbert Helmschrott, Schwenningen; Heinz Kelch, Buchenberg; Eduard Schuh, Villingen, and Hans Zimmermann, Schwenningen, all of Germany, assignors to Kienzle Apparate GmbH, Villingen Schwarzwald, Germany

Filed Sept. 24, 1973, Ser. No. 400,320

Claims priority, application Germany, Oct. 11, 1972, 2249628

Int. Cl. G01d *9/32*

U.S. Cl. 346—62 **18 Claims**



1. Apparatus for recording operational conditions of a motorcar, comprising a comparison device including first rotary input means comprising a motor rotating in only one direction and at a constant speed, secondary rotary input means rotating at a varying speed depending on the condition of the motorcar, control means including a movable member movable between first and second control positions, and transmission means connecting said first and said second rotary input means with said control means for placing said control member in said first and second control positions when said second rotary input means operates for selected time periods above and below a predetermined speed, respectively; and recording means and a recording surface movable relative to each other, said recording means being connected with said control member and placed in first and second recording positions by said control member in said first and second control positions, respectively, for automatically recording on said recording surface first and second graphs representing first and second time periods during which said motorcar operates in different operational conditions, respectively.

3,855,600
PRINTING DEVICE WITH STABILIZED PRINTING ELECTRODE

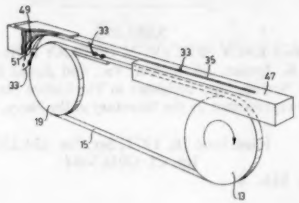
Theodorus Gerhardus Potma, Rijswijk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1972, Ser. No. 317,412

Claims priority, application Netherlands, Jan. 28, 1972, 7201224

Int. Cl. G01d *15/06, 15/24;* **G06k** *15/10*

U.S. Cl. 346—74 ES **10 Claims**



1. A printing device for printing images upon an information carrier, said images composed of dot-like or line-like elements, said printing device comprising:

a base member;

a belt supported upon said base member for movement about a plurality of pulleys;

an image electrode comprising a wire-like conductive member extending generally radially from and supported by said belt, said image electrode movable with said belt;

electrode guide means supported by said base member guiding said image electrode in a slot-like aperture during printing;

curved guide path means guiding said image electrode and having a curved guide path feeding the slot-like aperture of said electrode guide means for stabilizing the movement of said image electrode; and

a counter electrode supported by the base member and disposed opposite said belt, said information carrier passing between said belt and said counter electrode, and consequently between said image electrode and said counter electrode, when said image electrode is transported by belt in juxtaposition to said counter electrode, said information carrier thus receiving an electrostatic charge when said electrodes are adjacently disposed towards one another and a predetermined potential exists therebetween.

3,855,601
PHOTOMETER

Takashi Uchiyama, Yokohama; Tetsuya Taguchi, Kawasaki, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1973, Ser. No. 338,933

Claims priority, application Japan, Mar. 13, 1972, 47-25876

Int. Cl. G03b *15/05*

U.S. Cl. 354—31 **11 Claims**

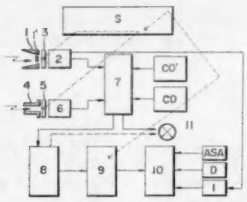
1. Exposure control system for a photo-taking apparatus for operation either in all natural light or with auxiliary synchronized flashlight, in a camera having a focus adjustment, comprising:

a photosensitive circuit including at least two photosensitive elements connected in series and oriented to receive light

from a field of view to be photographed, one of the elements receiving light from a portion of the field of view in which the object to be photographed is located and the other element receiving the light from the remaining portion of the field of view;

a comparator circuit having two inputs for voltages to be compared, one of the inputs being supplied with the output produced at the junction of said elements, the other being supplied with a predetermined voltage;

detecting means connected with said comparator circuit comprising a switching circuit having a predetermined threshold value, by virtue of said predetermined voltage, corresponding to the minimum difference in brightness between said object portion and said remaining portion of



said field of view that requires use of auxiliary flash, and change-over means electrically connected with the switching circuit and selectively activated by the output of the switching circuit;

auxiliary shutter-synchronized flash means; and

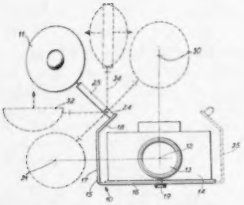
exposure control means responsive to at least one of said photosensitive elements for regulating at least one of the factors of exposure time and exposure aperture, said exposure control means comprising means for adjusting at least one of (1) the timing of said auxiliary flash means and (2) the aperture diaphragm of said phototaking apparatus, in each case in accordance with the distance from the object to be photographed as given by the setting of the focus adjustment.

3,855,602

A CAMERA FLASH BRACKET

Gerald W. Hoos, 1035 Wesley, Evanston, Ill. 60202

Filed Aug. 23, 1973, Ser. No. 391,028
Int. Cl. G03b *17/56*
U.S. Cl. 354—293 **8 Claims**



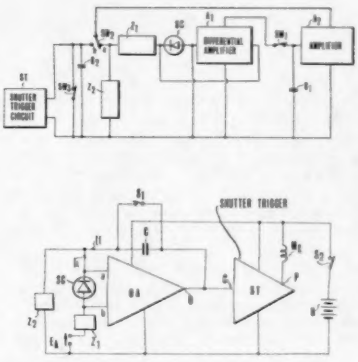
1. A bracket for attachment to a camera to position a flash attachment at different relative positions to a lens of the camera, comprising a one piece member having a first portion with a second portion extending from one end of the first portion at an angle of approximately **90°** thereto, said member having a third portion extending from an end of the second portion over the first portion at an angle of approximately **45°** to both of the first and second portions, said first portion providing a base for receiving the camera and having means for attaching a camera thereon, a first arm connected to the third portion, a second arm, means for connecting the second arm to the first arm, said connecting means enabling pivotal movement of the second arm through an arc which lies in a plane extending parallel to a plane defined by said first, second and third portions, said means for connecting the second arm to the first arm including an element maintaining a constant frictional lock therebetween to maintain the relationship of the arms in any position to which they are pivoted, said first and second arms having means coacting to provide stops for limiting the pivotal movement of the second arm to a 180° arc, a flash mounting member, and means for rotatably connecting the mounting member onto the second arm so that the flash attachment received on the mounting member can be selectively and adjustably positioned along an arc between a first position disposed over the center of the lens of the camera to a second position which is offset 90° therefrom and the orientation of the flash attachment can be rotated through an angle of at least 180°.

3,855,603

SHUTTER OPERATING CIRCUITS FOR PHOTOGRAPHIC CAMERAS

Osamu Ichihashi, Tokyo, Japan, assignor to Yashica Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1973, Ser. No. 415,316
Claims priority, application Japan, Apr. 13, 1973, 48-41895
Int. Cl. G03b *7/08;* **G01j** *1/46*
U.S. Cl. 354—51 **9 Claims**



1. A shutter operating circuit for a photographic camera, comprising a photoelectric transducer disposed to receive the light transmitted through the objective lens of said camera, first amplifier means for amplifying the output from said photoelectric transducer, second amplifier means having a high input impedance and operating to generate an output corresponding to the output from said first amplifier means, means for feeding back the output from said second amplifier means to the input of said first amplifier means, a capacitor connected on the input side of said second amplifier means for holding the output from said first amplifier means in accordance with the opening operation of the shutter of said camera, a first impedance element connected in series with said photoelectric transducer, a second impedance element connected in parallel with said series combination of said first impedance element and said photoelectric transducer, an integrating capacitor for integrating the output from said second amplifier means in accordance with the opening operation of said shutter, and a shutter trigger circuit for closing said shutter when the voltage across said integrating capacitor reaches a predetermined value whereby the exposure time is

determined by the output current from said second amplifier means which is proportional to the output from said photoelectric transducer and varied by utilizing the impedance of said first and second impedance elements as parameters.

3,855,604

AUTOMATIC EXPOSURE APPARATUS FOR CAMERAS

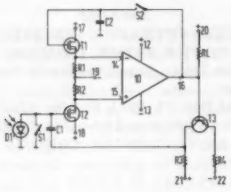
Gerhard Krause, Ringstrasse 26, 8019 Ebersberg, Germany

Filed July 27, 1973, Ser. No. 383,390

Claims priority, application Germany, Aug. 4, 1972, 2238522

Int. Cl. G01j 1/44; G03b 7/08

U.S. Cl. 354—60 **6 Claims**



1. An automatic exposure apparatus for a camera, comprising: an opto/electric light transducer for producing an exposure signal; an amplifier having first and second inputs, and an output for connection to a controlled device, said transducer connected to said first input, a feedback circuit connected between said output and said second input and having a variable feedback signal whose value preceding the exposure is large compared with its value during the exposure, said feedback circuit comprising storage means for storing a feedback signal representative of the exposure signal preceding said exposure; means operable to make said exposure signal and said feedback signal effective at their respective inputs to said amplifier during an exposure; and a switch closed before an exposure and connected in parallel with said transducer and opened during an exposure.

3,855,605

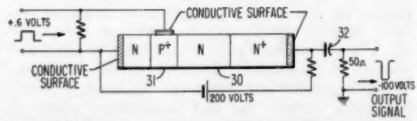
CARRIER INJECTED AVALANCHE DEVICE

Hirohisa Kawamoto, Hightstown, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 263,991, June 19, 1972, abandoned. This application July 27, 1973, Ser. No. 383,081

Int. Cl. H01l 1/00, 13/00

U.S. Cl. 357—13 **4 Claims**



1. In combination,

an avalanche diode having at least first, second and third crystalline semiconductor layers, said first and third layers being relatively highly doped semiconductor material and forming junctions with said second layer, said second layer being relatively lightly doped semiconductor material having a type of doping the same as said third layer but different from said first layer, said diode caused to operate in response to an electric field exceeding a critical magnitude within said second layer and having a magnitude greater than zero at said junction between said second and third layers,

means for applying a reverse bias signal across said first and third layers, said bias signal having a magnitude exceeding punch-through voltage, said bias signal establishing an electric field having a magnitude within said second layer substantially equal to but not exceeding the said critical magnitude of electric field necessary for said diode operation,

said electric field having a magnitude greater than zero at said junction between said second and third semiconductor layers and,

means for injecting carriers into said second semiconductor layer for increasing said electric field magnitude to exceed said critical magnitude for causing said diode operation.

3,855,606

SEMICONDUCTOR ARRANGEMENT

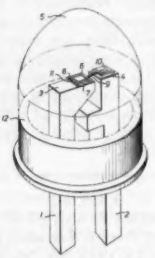
Werner Schoberl, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt/Main, Germany

Filed Dec. 12, 1972, Ser. No. 314,446

Claims priority, application Germany, Dec. 23, 1971, 2164092; Dec. 23, 1971, 7148428

Int. Cl. H01l 3/00, 5/00

U.S. Cl. 357—17 **10 Claims**



1. A semiconductor luminous diode arrangement for connection to voltage supply sources whose output voltage differs from the actual operating voltage of the diode comprising a diode housing having first and second feed lines leading into said housing, a semiconductor luminous diode electrically connected to said first feed line within said housing, electrical resistor means electrically connected to said second feed line within said housing, and means for connecting said resistor means to said diode to connect said diode and a resistance of said resistor means in series between said first and second feed lines.

3,855,607

SEMICONDUCTOR INJECTION LASER WITH REDUCED DIVERGENCE OF EMITTED BEAM

Henry Kressel, Elizabeth, N.J.; Harry Francis Lockwood, New York, N.Y., and Frank Zygmunt Hawrylo, Trenton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,665

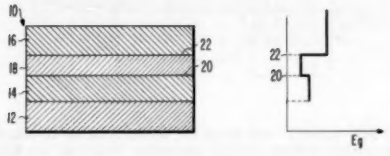
Int. Cl. H05b 33/00

U.S. Cl. 357—18 **9 Claims**

1. A semiconductor injection laser comprising a body of single crystalline semiconductor material having a first region of one conductivity type, a second region of a conductivity

type opposite to that of the first region and a third region between said first and second regions, said third region having at least a portion thereof of a conductivity type which is capable of generating light when a voltage is placed across said body,

the junctions between said third region and each of said first and second regions being heterojunctions which extend to an edge of the body, and



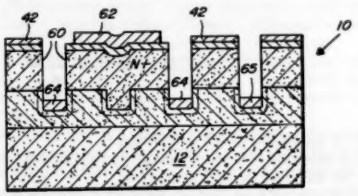
the third region having a bandgap energy which is lower than the bandgap energy of each of the first and second regions with the bandgap energy difference between the third region and the first region being less than the bandgap energy difference between the third region and the second region, such that, the ratio of the difference of the indices of refraction of the third region and the second region to the difference of the indices of refraction of the third region and the first region is in the order of 5 to 1.

3,855,608

VERTICAL CHANNEL JUNCTION FIELD-EFFECT TRANSISTORS AND METHOD OF MANUFACTURE

William Lloyd George; Robert Guy Hays, both of Chonokook, and John Rhee, Scottsdale, all of Ariz., assignors to Motorola Inc., Franklin Park, Ill.

Filed Oct. 24, 1972, Ser. No. 301,575
Int. Cl. H01l *11/14, 7/36, 7/50*
U.S. Cl. 357—22 **12 Claims**



1. A field effect transistor having controlled pinch-off characteristics and which is suitable for high frequency operation, including in combination:

first electrode means comprised of semiconductor material of a first conductivity type and having a first surface;

gate means comprised of semiconductor material of the second conductivity type which is integral with said first surface of said first electrode means and which has a plurality of integral portions each having a U-shaped cross-section, each of said gate portions having a horizontal segment and a plurality of straight, vertical segments which are substantially perpendicular to said horizontal segment;

source-to-drain channel portions defined by adjacent ones of said vertical gate segments and having substantially straight, vertical side walls;

second electrode means comprised of semiconductor material of the first conductivity type which is integral with said gate means and said source-to-drain channel portions; and

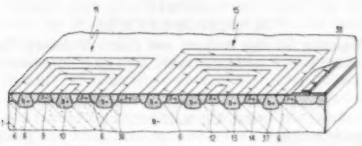
said semiconductor materials of said first electrode means and said second electrode means surrounding said gate means.

3,855,609

SPACE CHARGE LIMITED TRANSISTOR HAVING RECESSED DIELECTRIC ISOLATION

Ingrid E. Magdo, and Steven Magdo, both of Hopewell Junction, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,165
Int. Cl. H01l *11/14*
U.S. Cl. 357—22 **10 Claims**



1. A space charge limited transistor comprising:

a high resistivity substrate of at least 10,000 ohmcentimeter semiconductor material,

a first impurity zone of one conductivity type extending from one surface of said substrate into the interior thereof,

a pair of second impurity zones of the other conductivity type extending from said one surface of said substrate into the interior thereof,

said first zone being located between said second zones,

at least one recessed dielectric region extending from said one surface of said substrate into the interior thereof and separating a respective one of said second zones from said first zone, and

means for biasing said zones for transistor operation including means for forward biasing said first zone relative to one of said second zones and for reverse biasing said first zone relative to the other of said second zones,

the region of said high resistivity substrate beneath said one zone being characterized by a dielectric relaxation time much larger than the carrier transit time therein.

3,855,610

SEMICONDUCTOR DEVICE

Hiroo Masuda, Kokubunji; Toshiaki Masuhara, Tokorozawa; Minoru Nagata, Kodaira, and Tokinori Kozawa, Hachioji, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan

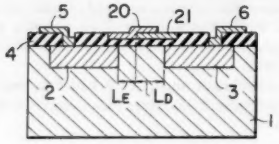
Filed June 26, 1972, Ser. No. 266,043
Claims priority, application Japan, June 25, 1971, 46-45669
Int. Cl. H01l *11/14*
U.S. Cl. 357—23 **21 Claims**

1. A method of manufacturing a metal-oxide-semiconductor field effect transistor comprising the steps of: forming first and second regions of a first conductivity type a prescribed distance from each other in a major surface of a

semiconductor substrate of a second conductivity type opposite said first conductivity type;

forming a first layer of insulating material over the surface of said substrate and said first and second regions;

providing a first electrode layer having a first prescribed work function on a first preselected portion of said first layer of insulating material between said regions; and



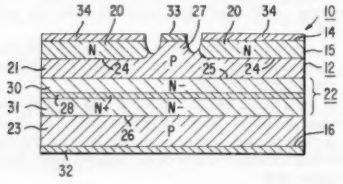
forming a second electrode layer having a second prescribed work function different from said first prescribed work function on a second preselected portion of said first layer of insulating material between said regions and so as to be contiguous with said first electrode layer.

3,855,611

THYRISTOR DEVICES

John Manning Savidge Neilson, and Harry Weisberg, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 11, 1973, Ser. No. 350,109
Int. Cl. h01l *11/10*
U.S. Cl. 357—38 **10 Claims**



1. A gated switching device comprising:

a body of semiconductor material having four regions in series with one another, adjacent regions being of opposite type conductivity and having a PN junction therebetween,

one of said regions being bounded by junctions which serve as voltage blocking junctions in the operation of said device,

said one region including a first portion of high conductivity to prevent the spread of a depletion layer from either of said blocking junctions entirely across said one region during operation of said device, and

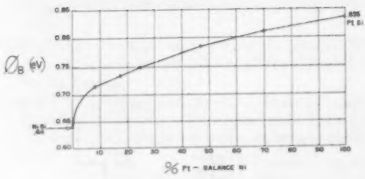
each of said blocking junctions bordering second portions of said body each having, within a thickness greater than the thickness of said portion of high conductivity, a total number of bound charges insufficient, when uncovered by a depletion layer upon application of a voltage across said device, to cause avalanche breakdown.

3,855,612

SCHOTTKY BARRIER DIODE SEMICONDUCTOR STRUCTURE AND METHOD

Warren C. Rosvold, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 214,590, Jan. 3, 1972, abandoned. This application Feb. 20, 1973, Ser. No. 334,022
Int. Cl. H01l *19/00*
U.S. Cl. 357—15 **3 Claims**



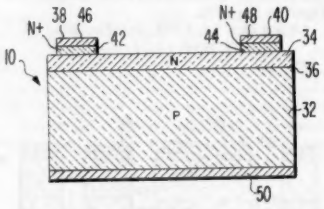
1. In a Schottky barrier diode semiconductor structure, a semiconductor body formed essentially of silicon and having a surface, an insulating layer formed on the surface and having an opening therein exposing a portion of the surface, a ternary alloy formed in said opening, said ternary alloy being formed of platinum and nickel and silicon of the semiconductor body to provide a Schottky barrier diode with a barrier height ranging from approximately .64 to approximately .835 electron volts as determined by the composition of the ternary alloy and in which the ternary alloy is comprised of approximately 50 percent silicon with nickel ranging from approximately 37 ½ to 45 percent of the alloy and with platinum constituting the balance.

3,855,613

SOLID STATE SWITCH USING AN IMPROVED JUNCTION FIELD EFFECT TRANSISTOR

Louis Sebastian Napoli, Hamilton Square, and Raymond Harkless Dean, Lawrenceville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 22, 1973, Ser. No. 372,648
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 357—22 **10 Claims**



1. A solid state switch comprising:

a. a substrate of a first conductivity type having a resistivity in the order of 10,000 ohm-cm;

b. a layer of a second conductivity type on said substrate forming a PN junction with said substrate, said layer having a sheet resistivity of less than 2,000 ohm/square while having an impurity concentration of less than that of said substrate;

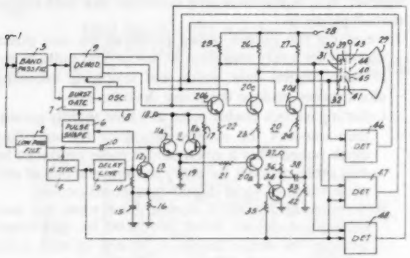
c. at least two ohmic contacts on said layer, and

d. a metallic contact on said substrate.

3,855,614
BEAM CURRENT CONTROL SYSTEM FOR A PICTURE TUBE

Takashi Okada, Yamato, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 22, 1972, Ser. No. 317,730
Claims priority, application Japan, Dec. 24, 1971, 46-2587
Int. Cl. H04n *9/16*
U.S. Cl. 358—74 **6 Claims**

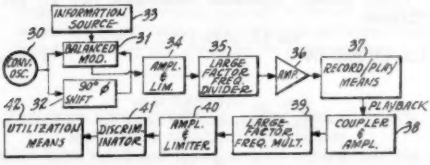


1. A beam current control system for a picture tube comprising a picture tube including at least one cathode electrode and a control electrode, means for applying a video signal to said cathode electrode, means for applying a pulse to said control electrode to cut off said picture tube, differential amplifier means for detecting the difference between a potential of said cathode electrode during each blanking interval and a potential of said cathode electrode when said picture tube is cut off, means for deriving a control signal from said detected difference and means for controlling a beam current of said picture tube in response to said control signal.

3,855,615
NOISE REDUCTION APPARATUS EMPLOYING PARAMETRIC FREQUENCY DIVIDERS WITH LARGE DIVISION FACTORS

Michael T. Shen, 8 Place Dargent, Eich, Luxembourg

Filed Jan. 22, 1973, Ser. No. 325,673
Int. Cl. G11b *5/04*
U.S. Cl. 360—30 **10 Claims**



1. Apparatus for converting an information bearing signal including components within a given frequency range into a low frequency modulated signal for improved noise operation when applied to an audio magnetic tape, comprising:

a. a conversion oscillator capable of providing at an output a stable signal, having a frequency substantially larger than any frequency component of said information bearing signal,

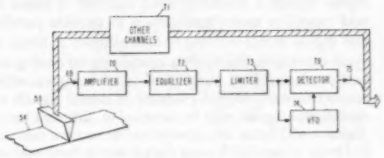
b. modulating means responsive to said conversion oscillator signal and said information bearing signal to provide at an output a frequency modulated (FM) signal with the carrier of said FM signal at said conversion oscillator frequency and modulated according to said information bearing signal, and

c. a parametric frequency divider having an input responsive to said FM signal to divide said signal by a factor greater than 100 as defined by the ratio of said carrier frequency and a center frequency within said frequency range of said information bearing signal, to provide at an output a low frequency FM signal capable of being recorded on a audio magnetic tape.

3,855,616
PHASE SHIFT REDUCING DIGITAL SIGNAL RECORDING HAVING NO D.C. COMPONENT

Richard C. Schneider, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 1, 1973, Ser. No. 402,568
Int. Cl. G11b *5/09*
U.S. Cl. 360—40 **10 Claims**



1. The method of recording two data values in a two-level magnetic record having successive bit cells, one cell for recording one data bit of either value,

the improvement including the steps in combination:

representing a first data value in a bit cell as an odd number of transitions between said magnetic levels within a bit cell and none at a bit cell boundary such that the magnetic levels following two successive bit cell boundaries differ;

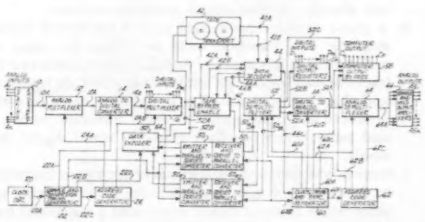
representing a second data value in a bit cell as an even number of transitions greater than two between said magnetic levels such that the magnetic levels following two successive bit cell boundaries are the same; and

timing said transitions such that the total time duration of each level in each and every bit cell is substantially equal.

3,855,617
UNIVERSAL DIGITAL DATA SYSTEM

Gene S. Jankowski, and Joseph A. Kibelbeck, both of Bremerton, Wash., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 284,663, Aug. 29, 1972,. This application Mar. 18, 1974, Ser. No. 451,922
Int. Cl. G11b *5/62*
U.S. Cl. 360—32 **4 Claims**



1. A system for the acquisition recording and reproduction of digital and analog data derived from a plurality of digital and analog signal sources, comprising:

a. an analog multiplexer connected so as to sample said plurality of analog signals a predetermined number of times during a repetitive multiplexing cycle that defines a predetermined number of slots to provide a serial output signal comprising a train of analog samples lying in some, but not all of, said slots, said predetermined number of times being variable with respect to each of said plurality of analog signals so that at least one of said

analog signals is sampled at a rate different than the rate said other analog signals are sampled;

b. an analog-to-digital converter, connected to said analog multiplexer so as to receive said serial output signal comprising a train of analog samples, for converting said analog samples into corresponding parallel format digital words to provide an output signal comprising a sequential train of parallel format digital words, one word being related to each of said analog samples, said sequential train of parallel format digital words having spaces therein determined by the slots of said repetive multiplexing cycle containing no related analog sample;

c. a digital multiplexer connected to sample said plurality of digital signals a predetermined number of times during said repetitive multiplexing cycle to provide parallel format digital words relating to said samples at times in said cycle corresponding to slots containing no analog sample, said predetermined number of times being variable with respect to each of said plurality of digital signals so that said digital signals may be sampled at different rates, said digital multiplexer also connected to receive said sequential train of parallel format digital words from said analog-to-digital converter and to insert said parallel format digital words related to said digital samples into spaces in said sequential train of parallel format digital words received from said analog-to-digital converter containing no related analog sample;

d. transmitter and parallel-to-series converter means connected to said digital multiplexer for converting said resultant sequential train of parallel format digital words into a predetermined number of pulse trains of serial digital words suitable for transmission and recording;

e. a first timing means connected for controlling said analog multiplexer, said analog-to-digital converter, said digital multiplexer and said transmitter and parallel to series converter means by inserting a sync signal into one slot defined by said repetitive multiplexing cycle

said timing means also adapted to generate a series of encoding clock pulses having a known period;

f. a phase encoder connected to said transmitter and parallel-to-series converter means and to said timing means so as to phase encode said pulse trains of serial digital words onto said series of encoding clock pulses having a known period;

g. a bandwidth limited magnetic tape transport having a plurality of recording channels at least equal in number to said predetermined number of pulse trains of serial digital words, said bandwidth limited magnetic tape transport being connected to said phase encoder for recording said phase encoded pulse trains of serial digital words on said plurality of channels on a one-to-one basis;

h. a phase decoder connected to said bandwidth limited magnetic tape transport so as to receive the phase encoded pulse trains of serial digital words recorded on the tracks of said bandwidth limited magnetic tape transport, said phase decoder including a transition detector which produces an output pulse for every transition in one of said pulse trains of phase encoded serial digital data words;

i. receiver and series-to-parallel converter means connected to the output of said phase decoder for converting said pulse trains of serial digital words into a sequential train of parallel format digital words;

j. a digital demultiplexer connected to the output of said receiver and series-to-parallel converter means for converting some of the words of said sequential train of parallel format digital words into digital signals equivalent to said sampled digital signals and some of the words of said sequential train of parallel format digital words into a set of parallel format digital words related to said sampled analog signals;

k. a digital-to-analog converter connected to said digital multiplexer to receive said set of parallel format digital words related to said sampled analog signals and convert said set of parallel format digital words into a serial train of analog signals equivalent to said sampled analog signal;

l. an analog demultiplexer connected to the output of said digital-to-analog converter for separating said serial train of analog signals into a plurality of analog signals related to said sampled analog signals; and,

m. a second timing means connected for receiving said sync signal and controlling said phase decoder, said receiver and series-to-parallel converter means, said digital demultiplexer, said digital-to-analog converter and said analog demultiplexer by:

1. receiving the output pulses produced by said phase decoder for every transition in one of said pulse trains of serial digital data words and supplying encoding clock pulses back to the phase decoder by:
   i. starting a clock enable pulse at a time slightly greater than one-half the known period or the encoding clock pulses after a given output pulse produced by said phase decoder for every transition in one of said pulse trains of serial digital data words occurs;
   ii. terminating the clock enable pulse when the next subsequent output pulse, produced by said phase decoder for every transition in one of said pulse trains of serial digital data words, occurs;
   iii. extracting encoding clock pulses from the output pulses, produced by said phase decoder for every transition in one of said pulse trains of serial digital data words upon the coincidence of a logic transition in said output pulses and said clock enable pulses; and,
   iv. supplying the extracted encoding clock pulses back to said phase decoder; and,
2. controlling the output frequency of a VCO by phase comparing the extracted encoding clock pulses with the output pulses generated by the VCO, the output of the VCO being used for controlling the operation of said digital demultiplexer, said digital-to-analog converter and said analog demultiplexer.

3,855,618

MAGNETIC HEAD HAVING VARIABLE GAP LENGTH

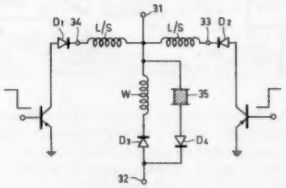
Jacob Koorneef; Jan Antoon Ludolf Potgiesser, and Anthonie Walraven, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 9, 1973, Ser. No. 404,357

Claims priority, application Netherlands, Oct. 27, 1972, 7214548

Int. Cl. G11b *15/02, 5/24*

U.S. Cl. 360—69 **8 Claims**



1. A magnetic head for recording and playing back which comprises:

a core including first and second magnetizable pole pieces, each magnetizable pole piece having a gap bounding face, said gap bounding faces being disposed in generally opposed relation forming a transducing gap, at least one of said magnetizable pole pieces having secured thereto means for displacing said magnetizable pole piece between a recording position and a playback position thereby changing the gap length between said gap bounding faces, said means comprising an electrostrictive transducer responsive to a control voltage applied thereto, said

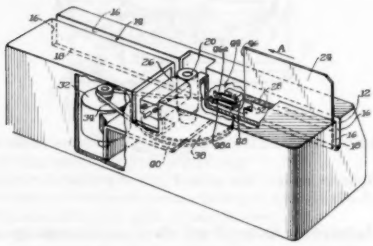
control voltage being varied responsive to the recording mode of operation of the head and the playback mode of operation of the head.

3,855,619

MAGNETIC CARD READOUT MACHINE AND CARDS THEREFOR

Fred Kral, Lake Villa, and Robert L. Powers, Jr., Palatine, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 8, 1973, Ser. No. 321,902
Int. Cl. G11b *5/80, 15/06, 15/46*
U.S. Cl. 360—73 **12 Claims**



1. The combination of a plural speed card readout machine and cards for use therewith, the machine comprising:

plural speed drive means for transporting one of said cards along a card guide path past transducing means;

electrical control means for operating said drive means at a plurality of selected pre-set different speeds, including a plurality of switch means at said card guide path for actuation in a plurality of different sequences to determine the operating speed of said drive means; and

the card comprising:

a support media transportable by said drive means along said card guide path through said machine;

magnetic media carried on said support media for being transduced at a selected of a plurality of pre-set drive speeds; and

means on said support media for actuating said switch means in a predetermined sequence to operate said drive means at a speed corresponding to the proper transducing speed of the magnetic media on the respective card.

3,855,620

HEAD FEED MEANS FOR MAGNETIC SPIRAL TRACK RECORDER HAVING TWO HEADS

Saburo Kato, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed May 18, 1973, Ser. No. 361,783
Claims priority, application Japan, May 16, 1972, 47-52619
Int. Cl. G11b *21/02*
U.S. Cl. 360—101 **9 Claims**

1. A head feed device for magnetic recording and reproducing apparatus of the spiral track type comprising

a. a turntable;

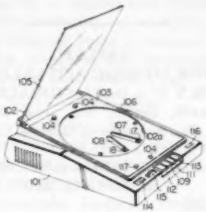
b. a head carriage;

c. means mounting said head carriage on said turntable for movement of the carriage in a straight line at a constant pitch from the peripheral portion of the turntable to the central portion thereof as the turntable rotates in a predetermined direction;

d. a magnetic recording and reproducing head supported by said head carriage for movement from the peripheral portion of the turntable to the central portion thereof while tracing a spiral track of a constant pitch as the turntable rotates in said predetermined direction and the head carriage moves in a straight line from the peripheral portion of the turntable to the central portion thereof;

e. an erasing head supported by said head carriage for movement to trace the same spiral track as the magnetic recording and reproducing head;

f. means for guiding said two heads along converging straight lines passing through the center of rotation of the turntable, such that said erasing head precedes said re-



cording head along said track in movement toward the turntable central portion, while maintaining said erasing head closer than said recording head to the center of turntable rotation by a radial distance equal to $P\theta/360$ wherein P is the pitch of said track and θ is the angle, in degrees, included between said straight lines; and

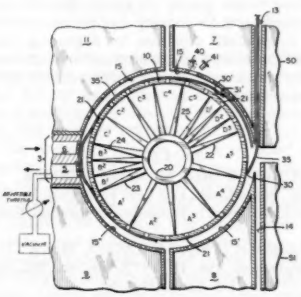
g. means driven by rotation of said turntable in said predetermined direction for moving said carriage and heads toward the center of the turntable as aforesaid.

3,855,621

PNEUMATIC NO-CONTACT DOCUMENT READ/WRITE STATION

Richard S. Gluskin, Wayne; Eugene B. Barcaro, Norristown; Edwin R. Phillips, Rosemont; Arnold Schonfeld, Norristown, and Joseph Van Reymersdal, Fairless Hills, all of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 22, 1972, Ser. No. 317,814
Int. Cl. G11b *5/60*
U.S. Cl. 360—102 **18 Claims**



1. A non-contact read/write station comprising:

a. a rotating drum means, said drum having raised rims at its extremities;

b. a flexible member having a magnetic recording surface wherein the length of said member is greater than the circumference of a rotating drum means;

c. means for accurately positioning said member on said drum means such that the members leading and trailing edge overlap;

d. a fixed read-record carcass means including a plurality of read/write heads located outside the periphery of said drum means for executing a read/write cycle;

e. means for removing said member from said rotating drum and additional means in said carcass for allowing it to be brought near said read/write head, such that the magnetic recording surface is positioned immediately next to said read/write head but without contact;

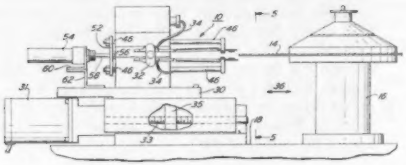
f. means for returning said member to said rotating drum after said read/write cycle is completed, a bubble configuration being formed in said member in the vicinity of said read/write head.

3,855,622

APPARATUS FOR LOADING AND UNLOADING A HEAD ASSEMBLY IN A DATA STORAGE SYSTEM

Peter J. Truscelli, Berlin, N.J., and Robert Provasnik, Philadelphia, Pa., assignors to Siemens Corporation, Iselin, N.J.

Filed Jan. 4, 1973, Ser. No. 320,878
Int. Cl. G11b *5/60*
U.S. Cl. 360—103 **10 Claims**



1. Apparatus for loading and unloading into and out of a flying height position respectively, at least one transducer in relation to a rotating disc in a data storage system, comprising:

a. head means having said transducer fixedly secured thereto and having an inclined ramp;

b. carriage means moveably mounted to said data storage system for moving said head means in a longitudinal direction with respect to said rotating disc; and,

c. driving means moveably secured to said carriage means, said driving means having pin means slideably engaging said inclined ramp for moving said pin means reversibly in said longitudinal direction for displacing said head means into and out of said loaded and unloaded positions in relation to said rotating disc independent of said longitudinal movement of said head means.

3,855,623

MODULAR DISK MEMORY SYSTEM

Sung Pal Chur, Santa Clara, and Leon H. Brown, Jr., San Jose, both of Calif., assignors to Dataflux Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 126,484, March 22, 1971. This application Apr. 18, 1973, Ser. No. 352,216
Int. Cl. G11b *5/60*
U.S. Cl. 360—103 **34 Claims**

1. A head per track disk file system comprising:

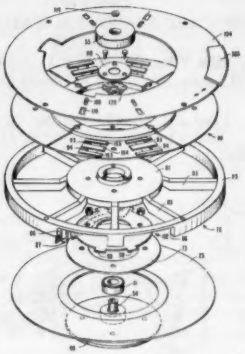
a pair of spoked wheel members mounted about a central axis and having abutting rim elements defining a low profile cylinder having a peripheral rim;

central shaft means rotatably mounted along said central axis in each of said spoked wheel members;

at least one magnetic disk means mounted on said shaft means in a central region therealong between the wheel members and normal to the central axis;

a pair of generally flat head support means, each disposed adjacent and parallel to a different one of said wheel members on the opposite side from said disk means and substantially parallel thereto;

and magnetic head assembly means mounted on each of said head support means and extending through spaces



between the spokes of said wheel members into operative relation with the adjacent face of said disk means.

3,855,624

GROOVED AIR BEARING HEAD

Jacobus Pieter Reinhoudt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

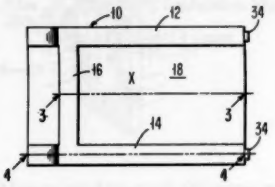
Filed Aug. 15, 1973, Ser. No. 388,395
Int. Cl. G11b *5/60*
U.S. Cl. 360—103 **4 Claims**

1. A device for the processing of data in the form of magnetic recordings on a rotatable recording disc by means of one or more magnetic heads, which are accommodated in a head plate which during operation is spaced at a relatively small distance from the recording disc, the surface of said plate which faces the recording disc being recessed, characterized in that said surface of the head plate comprises at least two groove pattern means, for producing opposite pressures during rotation of the recording disc in a gap which is present between the recording disc and the head plate during operation, the geometry of one of the groove pattern means comprising means for providing a positive bearing capacity which greatly depends on the gap height, and a high rigidity, for one specific direction of rotation one pattern whereas the geometry of the other pattern, having deeper grooves than those of said first pattern, comprises means for providing a negative bearing capacity, which is substantially gap-independent, and a low rigidity for said one direction of rotation, whereby for a specific design gap height the sum of the bearing capacities is zero and a high positive rigidity prevails.

3,855,625
MAGNETIC HEAD SLIDER ASSEMBLY

Michael F. Garnier; Tung-Men Tang, both of San Jose, and James W. White, Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,382
Int. Cl. G11b *5/60, 21/20*
U.S. Cl. 360—103 **12 Claims**



1. A slider assembly for supporting a transducer in relation to a moving record medium comprising:

a support structure having leading and trailing edges relative to the motion of said medium and a longitudinal axis disposed along the path of said motion;

side rails disposed along the side edges of a surface of said support structure;

a cross rail disposed laterally across the surface of said structure joining said side rails;

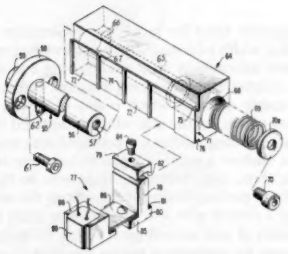
said rails defining a recessed section trailing said cross rail, said recessed section being closed on three sides by said rails;

so that a negative pressure region is established at such recessed section, while positive pressure regions are established at said side rails, whereby said surface of said support structure flies very closely to the moving record medium at a substantially constant height.

3,855,626
TRANSDUCER HEAD MOUNTING APPARATUS

John O. McCarty, Atlanta, and Leary W. Smith, Chamblee, both of Ga., assignors to The Audichron Company, Atlanta, Ga.

Division of Ser. No. 165,902, July 26, 1971, Pat. No. 3,787,637. This application July 30, 1973, Ser. No. 384,011
Int. Cl. G11b *5/50, 15/02*
U.S. Cl. 360—104 **6 Claims**



1. Recording head mounting apparatus for an audio transducing system, comprising:

a mounting post positioned in spaced apart relation to a movable transducing medium and extending in a transverse relation to the direction of movement of the recording medium;

a head mounting bar connected to said mounting post and extending in transverse relation to the recording medium;

locating means on said head mounting bar defining at least one head locating position on said head mounting bar in predetermined position relative to the recording medium;

a head assembly including a transducing head, and positioning means connected to said transducing head;

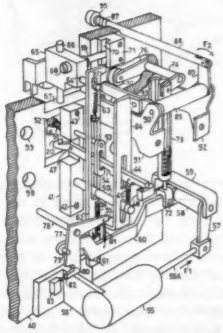
said positioning means being engagable in predetermined certain alignment with said head locating means on said head mounting bar to dispose said transducing head in positive location contacting the recording medium; and

means on said positioning means to releasably interconnect said positioning means in said predetermined certain alignment with said head mounting bar.

3,855,627
PROTECTIVE INTERLOCK CONTROLLING MOVEMENT OF HEAD AND PINCH ROLLER INTO OPERATIVE POSITION

Bruno Vettore, Cornaredo; Ferruccio Enrini, Milano, and Tullio Percali, Settala, all of Italy, assignors to Honeywell Information Systems Italia, Milan, Italy

Filed June 14, 1973, Ser. No. 370,097
Claims priority, application Italy, June 23, 1972, 26120/72
Int. Cl. G11b *5/54, 5/56, 21/24*
U.S. Cl. 360—105 **4 Claims**



1. In a tape cassette recorder having a main frame, a magnetic head, means slidably mounting said magnetic head on said frame for movement between an operating position and a retracted position, a pressure roller lever means pivotally mounting said pressure roller on said frame for movement between an operating position and a retracted position, a cover having a pocket for said tape cassette, means pivotally mounting said cover on said frame, for movement between an open and closed position, a device for loading and removing the tape cassette, including: a first spring means for biasing said magnetic head to said operating position, a bar, means slidably mounting said bar on said frame for movement between an operating position and a retracted position, a second spring means biasing said bar to said retracted position, means coupling said bar to said means slidably mounting said magnetic head to maintain said magnetic head in said retracted position when said bar is in its retracted position and to leave said magnetic head free to reach its operating position when said bar is in its operating position, a hooking lever, means pivotally mounting said hooking lever on said frame, spring means biasing said hooking lever to a hooking position cooperating with said cover to hook said cover in said closed position, a movable probing member carried by said frame and positioned to be contacted by a tape cassette contained in said cover pocket means mounting said probing member for movement to an operative position when contacted by a cassette, said probing member having means normally engaging said hooking lever and limiting pivoting thereof, and said probing

member means when said probing member is in said operating position allowing a further pivoting of said hooking lever, a switch actuated by said hooking lever when further pivoting of said hooking lever is allowed by said probing member, an electromagnet, mounted on said frame and energized by actuation of said switch leverage means connected to said bar and said lever means for moving both into said operating position upon energization of said electromagnet, a pawl means mounted on said frame for maintaining said leverage means in said operated position even when the electromagnet is de-energized, and release means for disengaging first said pawl means and subsequently said hooking lever to release said cover and allow the opening of said cover.

3,855,628

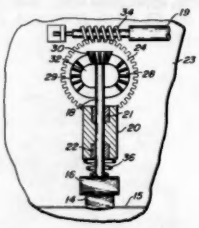
TAPE HEAD ROTATOR MECHANISM

Mario E. Bachmann, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 16, 1973, Ser. No. 333,411

Int. Cl. G11b *21/08*

U.S. Cl. 360—106 **4 Claims**



1. A tape recorder/reproducer utilizing tape having at least two sets of tracks thereon including in combination, a tape head having a pick up portion, actuator means, drive gear means coupled to said actuator means, said drive gear means including a portion having a plurality of gear sections, a cam mounted for rotation by said drive gear means, a shaft having said tape head mounted on one end thereof and gear means mounted on the other end thereof, and means for mounting said shaft for longitudinally slidable movement, whereby said actuator means in response to a predetermined event rotates said drive means to engage said cam with said gear means on the end of said shaft to longitudinally slide the shaft thereby moving said tape head away from the tape, with one of said plurality of gear sections of said drive gear means engaging said gear means on said shaft to rotate said tape head 180°, and resilient means connected between said shaft mounting means and said tape head for re-engaging said tape head with said tape with said tape head being rotated 180°.

3,855,629

COMBINED MAGNETIC HEAD FOR RECORDING AND PLAYBACK HAVING ADJUSTABLE END FACES

Jacob Koorneef; Jan Antoon Ludolf Potgiesser, and Anthonie Walraven, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 21, 1973, Ser. No. 372,281

Claims priority, application Netherlands, July 26, 1972, 7210322

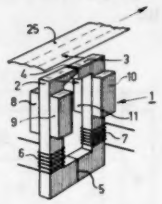
Int. Cl. G11b *5/22*

U.S. Cl. 360—113 **7 Claims**

1. A magnetic head apparatus for recording and playing back information in cooperation with an elongated magnetizable recording medium which may be selectively traversed, the combination which comprises:

a first core part disposed with at least a portion thereof proximate the magnetizable recording medium;

a second core part disposed with at least a portion thereof proximate the magnetizable recording medium, said portion of said first core part and said portion of said second core part being disposed in proximate, opposed, spaced relationships;



means for varying the alignment between said first core part portion and said second core part portion in a direction transverse to the elongated magnetizable recording medium, said means selectively causing said one of said parts to be aligned with a different longitudinal portion of said magnetizable recording means and the other of said parts.

3,855,630

COMBINED MAGNETIC HEAD FOR RECORDING AND PLAYBACK HAVING ADJUSTABLE END FACES

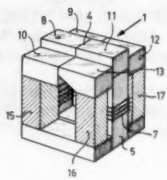
Jacob Koorneef; Jan Antoon Ludolf Potgiesser, and Anthonie Walraven, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed June 25, 1973, Ser. No. 373,509

Claims priority, application Netherlands, July 26, 1972, 721323

Int. Cl. G11b *5/22*

U.S. Cl. 360—113 **3 Claims**



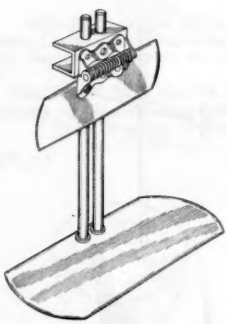
1. A magnetic head for recording information on a track having a first width of a magnetizable recording medium and playing back information on a track having a second smaller width of a magnetizable recording medium, comprising a core of magnetizable material which is provided with an electric winding and which, on the side which is destined for cooperation with a recording medium, is provided with two end members which enclose a recording gap at least one end member comprising three parts extending transverse to the recording gap, said three parts extending transverse to the recording gap comprising a central part and two extreme parts disposed on opposite sides of said central part, means for supporting said extreme parts for movement during playback operation relative to the central part in a direction away from the longitudinal axis of the recording medium, means for moving said extreme parts responsive to an electromotive force selectively during playback operation, relative to the central part in a direction away from the longitudinal axis of a recording medium to be scanned, the overall width of the three parts being equal to the first width, the width of the central part being equal to the said second width.

DESIGNS

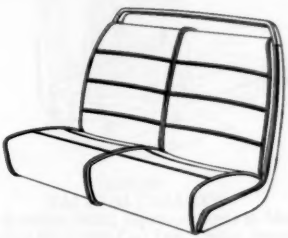
DECEMBER 17, 1974

233,918
TRANSIT SEAT
Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Continuation-in-part of design application Ser. No. 238,744, Mar. 27, 1972. This application May 11, 1973, Ser. No. 359,304
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26

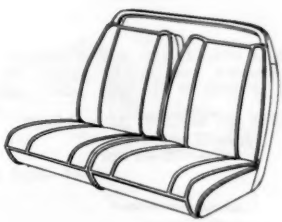
233,919
BINOCULAR HOLDER
Thomas H. Horst, Lafayette, Colo., assignor to Western Sales and Supply Co., Denver, Colo.
Filed Aug. 7, 1972, Ser. No. 278,590
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—28



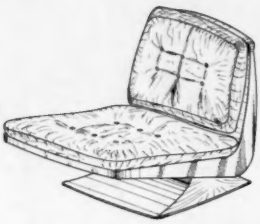
233,920
SEAT FOR A TRANSIT VEHICLE
Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed May 14, 1973, Ser. No. 360,018
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48



233,921
SEAT FOR A TRANSIT VEHICLE
Chester J. Barecki, Grand Rapids, Mich, assignor to American Seating Company, Grand Rapids, Mich.
Filed May 14, 1973, Ser. No. 360,020
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48



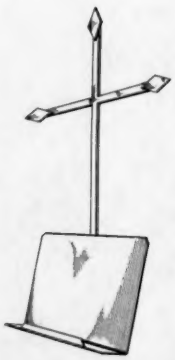
233,922
CHAIR
Raymond Grosfillex, Arbent, France, assignor to Grosfillex S.A.R.L., Arbent (Ain), France
Filed May 21, 1973, Ser. No. 362,069
Claims priority, application France Nov. 24, 1972
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26



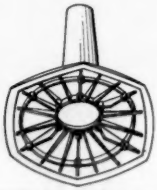
233,923
ARMCHAIR
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti Industria Arredamenti di Saporiti Sergio e Giorgio S.N.C., Besnate (Varese), Italy
Filed Mar. 20, 1973, Ser. No. 343,008
Claims priority, application Italy Sept. 22, 1972
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

233,924
ARMOIRE OR SIMILAR ARTICLE
Huey T. Keller, 1609 Davidson Road, High Point, N.C. 27260
Continuation-in-part of design application Ser. No. 125,000, Mar. 16, 1971. This application Dec. 15, 1972, Ser. No. 315,427
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164

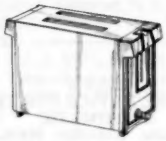
233,925
COMBINED BIBLE RACK AND CROSS
Harley Ammermann, Box 526, Clara City, Minn. 56222
Filed Apr. 12, 1973, Ser. No. 350,385
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—184



233,926
FURNITURE BASE
Harry Sebel, Darling Point, New South Wales, Australia (96 Canterbury Road, Bankstown, New South Wales, 2200 Australia)
Filed Apr. 23, 1973, Ser. No. 353,666
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194

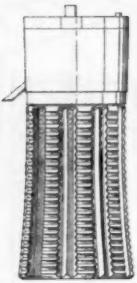


233,927
TOASTER
Masatoshi Naito, Ikeda, Fujio Sawamura, Toyonaka, Kunio Funatsu, Osaka, and Noriharu Furuyabu, Ashiya, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Original design application May 22, 1972, Ser. No. 255,950. Divided and this application Aug. 24, 1973, Ser. No. 391,310
Claims priority, application Japan Nov. 26, 1971
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—93



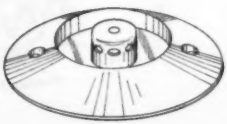
233,928
NON-BOIL OVER MILK PAN
Bernard Sams, London, and Albert Edward Cook, Wolverhampton, England, assignors to Tower Housewares Limited
Filed May 7, 1973, Ser. No. 358,162
Claims priority, application Great Britain Nov. 9, 1972
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—95

233,929
COMBINED MIXER AND DISPENSER FOR LIQUIDS
Se-kit Yuen, 46 Hoi Yuen Road, 4th Floor, Kwun Tong, Kowloon, Hong Kong
Filed Mar. 6, 1973, Ser. No. 338,623
Claims priority, application Great Britain Oct. 12, 1972
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—157

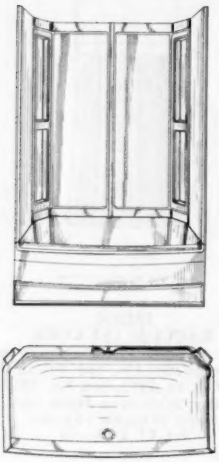


233,930
VACUUM CLEANER
Toshihiko Yoshida, Suita, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 16, 1973, Ser. No. 406,883
Claims priority, application Japan Apr. 17, 1973
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—165

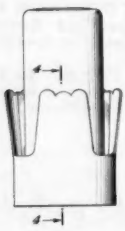
233,931
ULTRASONIC INTRUSION ALARM
Ralph W. Goble, Eldora, and Kenneth R. Hackett, Boulder, Colo., assignors to Sontrix, Inc., Boulder, Colo.
Filed Dec. 21, 1972, Ser. No. 317,267
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D10—106



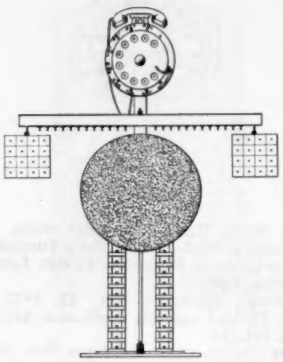
233,932
COMBINATION BATHTUB AND SHOWER STALL
Merritt W. Seymour, Sylvania, Ohio, assignor to Owens-Corning Fiberglas Corporation
Filed Apr. 16, 1973, Ser. No. 351,207
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



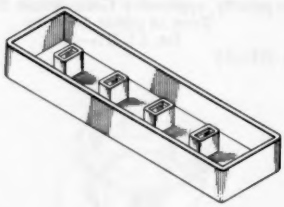
233,933
DISPENSING CONTAINER FOR DEODORANTS OR THE LIKE
David Mahler, 9023 Hopen Place, Los Angeles, Calif. 90069
Filed June 5, 1972, Ser. No. 260,046
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



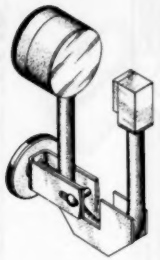
233,934
EDUCATIONAL MANNIKIN FOR MATHEMATICAL CONCEPTS
Marlene L. Drouin, 289 Pembroke St., Concord, N.H. 03301
Filed July 6, 1972, Ser. No. 269,375
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R



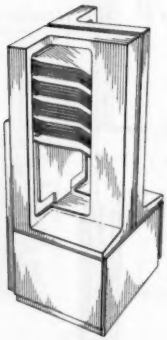
233,935
EDUCATIONAL DEVICE FOR TEACHING ARITHMETIC
Philip J. Schroeder, Wellesley, Mass., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 26, 1973, Ser. No. 326,905
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R



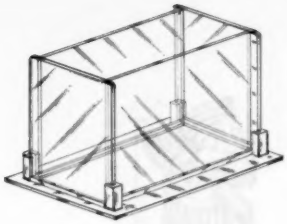
233,936
ELECTRICAL SENSING DEVICE FOR COUNTING PIECES OF PAPER PASSING THROUGH A PRINTING PRESS
Leon Jones, 11332 Pemberton Road, Los Alamitos, Calif. 90720
Filed Apr. 19, 1972, Ser. No. 245,687
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D26—1 Q



233,937
SORTER
Claude H. Hutcheson, Fairport, N.Y., and John F. Zinni, London, England, assignors to Xerox Corporation, Stamford, Conn.
Filed Jan. 5, 1973, Ser. No. 321,492
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D26—5 C



233,938
AQUARIUM
Samuel Shalom, 577 Grand St., New York, N.Y. 10002
Filed Nov. 6, 1972, Ser. No. 304,232
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—6



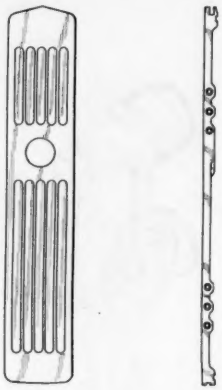
233,939
AQUARIUM
Samuel Shalom, 577 Grand St., New York, N.Y. 10002
Filed Sept. 28, 1972, Ser. No. 293,049
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—6

233,940
NOVELTY DOLL
Terrance R. Mitchell, 1484 W. Highway 96, St. Paul, Minn. 55112
Filed Jan. 29, 1973, Ser. No. 327,837
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

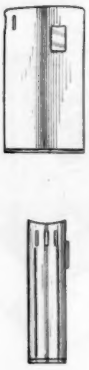
233,941
TOY DOLL
Terrance R. Mitchell, St. Paul, Minn., assignor to Cortez Industries, Inc., Minneapolis, Minn.
Filed Jan. 31, 1973, Ser. No. 328,328
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

233,942
COMBINED GOLF TEE INDICATOR, BALL WASHER, WASTE RECEPTACLE AND SHOE SCRAPER
Leslie Leonard Sapier, Vaucluse, New South Wales, Australia, assignor to Maria Sapier, Vaucluse, New South Wales, Australia
Filed Apr. 12, 1973, Ser. No. 350,478
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

233,943
RELEASE PLATE FOR A SAFETY SKI BINDING
Ulrich Gertsch, Matten, and Hans Eichenberger, Stuckishaus, Switzerland, assignors to Gertsch A.G., Wengen, Switzerland
Filed May 17, 1973, Ser. No. 361,214
Claims priority, application Switzerland Jan. 12, 1973
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—14 D

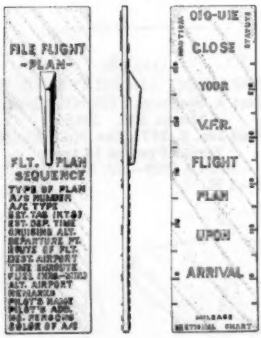


233,944
CIGARETTE LIGHTER
Pierre Toiseux, Bellegarde-sur-Valserine, France, assignor to Ronson Corporation, Woodbridge, N.J.
Filed July 10, 1972, Ser. No. 270,277
Term of patent 14 years
The term of this patent subsequent to Dec. 26, 1986, has been disclaimed
Int. Cl. D27—*05*
U.S. Cl. D48—27 R

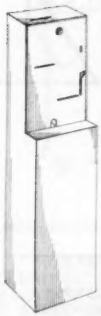


233,945
JEWELRY FINDING
J. Neale Burns, 2422 22nd St., Newport Beach, Calif. 92660
Filed Oct. 10, 1972, Ser. No. 295,856
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—19 S

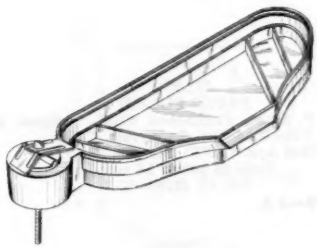
233,946
COMBINED FLIGHT PLAN SEQUENCE REMINDER AND MILEAGE SCALE
James L. Wallace, Weatherford, Tex. (501 Coal Bank Road, Doylestown, Ohio 44230)
Filed Apr. 26, 1973, Ser. No. 354,863
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—6 A



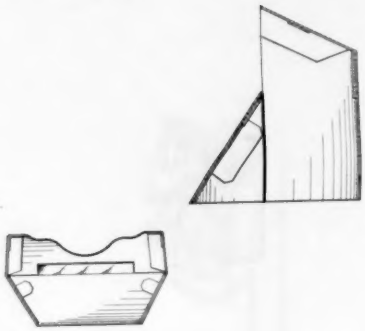
233,947
COIN OPERATED PLASTIC LAMINATING MACHINE OR SIMILAR ARTICLE
William T. Johnson and Sally M. Johnson, both of 1060 E. 46th St., Long Beach, Calif. 90807
Filed Feb. 9, 1973, Ser. No. 330,967
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1 F



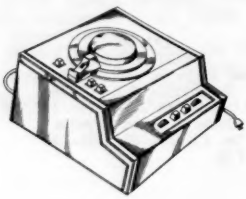
233,948
PIVOTAL TRAY
Samuel M. Seltzer, 85 Athens Road, Short Hills, N.J. 07078
Filed Oct. 24, 1972, Ser. No. 299,655
Term of patent 14 years
Int. Cl. D8—*99*, D15—*99*
U.S. Cl. D55—1 H



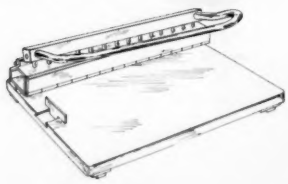
233,949
FOLDED PAPERBOARD OPTICAL VIEWER OR THE LIKE
Charles R. Gretz, Springfield, Mo., assignor to CTV Products, Inc., Springfield, Mo.
Filed Nov. 9, 1972, Ser. No. 305,160
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 E



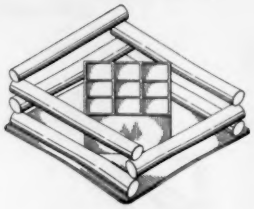
233,950
PRINTER
Gary R. Bluem, Minneapolis, Minn., assignor to Kroy Industries, Inc., Stillwater, Minn.
Filed Mar. 26, 1973, Ser. No. 345,080
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R



233,951
PAPER PUNCH
Danilo P. Buan, Pleasanton, Calif., assignor to Velo-Bind, Inc., Sunnyvale, Calif.
Filed Apr. 6, 1973, Ser. No. 348,728
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1 A

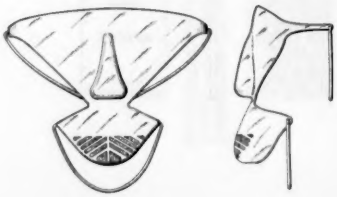


233,952
PENCIL HOLDER
Weldon W. Shay, 2324 S. Ewing, Dallas Tex. 75216
Filed June 1, 1973, Ser. No. 366,080
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5 A



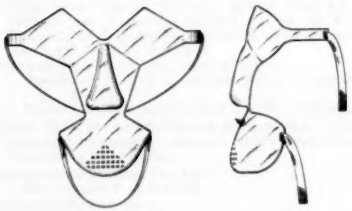
233,953
TRANSPARENT AIR FILTERING MASK
Robert A. Stegmon, 2151 NE. 124th St., Miami, Fla. 33156
Filed Jan. 8, 1973, Ser. No. 321,640
Term of patent 14 years
Int. Cl. D29—*02*; D24—*99*
U.S. Cl. D83— 1 K

233,954
TRANSPARENT AIR FILTERING MASK
Robert A. Stegmon, 2151 NE. 124th St., Miami, Fla. 33156
Filed Jan. 8, 1973, Ser. No. 321,638
Term of patent 14 years
Int. Cl. D29—*02*; D24—*99*
U.S. Cl. D83—1 K



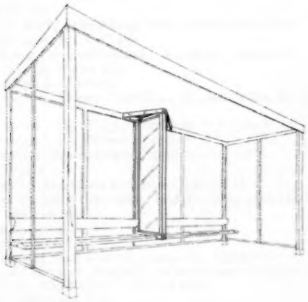
233,955
LUGGAGE CASE
Walter Bialo, New York, N.Y.
(32-33 47th Ave., Long Island City, N.Y. 11101)
Filed June 27, 1972, Ser. No. 266,666
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 F

233,956
TRANSPARENT AIR FILTERING MASK
Robert A. Stegmon, 2151 NE. 124th St.,
Miami, Fla. 33156
Filed Jan. 8, 1973, Ser. No. 321,639
Term of patent 14 years
Int. Cl. D29—*02*; D24—*99*
U.S. Cl. D83—1 K



233,957
HAIR CLIPPER
Charles R. Struck, 125 Arboleda Road,
Santa Barbara, Calif. 93110
Filed Feb. 5, 1973, Ser. No. 329,742
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

233,958
COMBINED ILLUMINATED BUS SCHEDULE HOLDER AND SEAT PARTITION
Richard L. Sklaar, 13 Terrace Circle,
Great Neck, N.Y. 11021
Filed June 28, 1972, Ser. No. 267,133
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 J



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TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF DECEMBER, 1974

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Bahal, Surendra M., to American Home Products Corporation. Method of stabilization of 6-(1-aminocyclohexane-carboxamido)penicillanic acid and resultant compositions. 3,855,411, Cl. 424-176.000.

BAI Corporation: *See—*
Altman, Norman G.; and Dreyfus, Marc G., 3,854,822.

Bailey, Denis M., to Sterling Drug, Inc. 3,4-Dihydro-1-or 3-(polyfluoroalkyl)-2(1H)-isoquinolinecarboxamidoximes. 3,855,228, Cl. 260-288.00r.

Bailey, Richard L. Mobile reel support unit. 3,854,509, Cl. 242-86.50r.

Baillie, William R., to Blue Ribbon Industries, Inc. Wire protector for mobile homes and the like. 3,855,413, Cl. 174-48.000.

Baker, Robert Lisle. Space enclosing structure. 3,854,255, Cl. 52-81.000.

Balas, John Thomas, to Wheaton Industries. Magnetic cell stirrer. 3,854,704, Cl. 259-118.000.

Balder, Alton Parker. Screened photograph puzzle. 3,854,726, Cl. 273-157.00r.

Balland, Jean, to Societe dite: Manufacture de Produits Chimiques PROTEX Societe francaise a Responsabilite Limitee Siege Social. Process for dyeing of polyacrylonitrile fibers. 3,854,872, Cl. 8-169.000.

Balwe, Thomas: *See—*
Kurz, Kieter; Bauer, Johann; Balwe, Thomas; Fendel, Kurt; and Sabel, Alex, 3,855,190.

Balzer, Daniel Lee; and Lake, Ralph Jones, Jr., to RCA Corporation. Storage system for two phase fluids. 3,854,905, Cl. 55-159.000.

Balzers Patent- und Beteiligungs-Aktiengesellschaft: *See—*
Thelen, Alfred, 3,854,796.

Bandoch, Rudolf; and Sodomka, Karel, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Adjustable stitch cam. 3,854,305, Cl. 66-54.000.

Barber, Stephen W.; and Nelson, William F., to Owens-Illinois, Inc. Luminescent device, process, composition, and article. 3,855,144, Cl. 252-301.40f.

Barcaro, Eugene B.: *See—*
Gluskin, Richard S.; Barcaro, Eugene B.; Phillips, Edwin R.; Schonfeld, Arnold; and Van Reymersdal, Joseph, 3,855,621.

Barcroft, Frederick J. Power transfer unit for tandem wheels. 3,854,545, Cl. 180-24.120.

Bardet, Michel, to Stephens, Buckeye, Limited. Incubators for eggs. 3,854,452, Cl. 119-37.000.

Barnes Engineering Company: *See—*
Ward, Kenneth A., 3,855,474.

Barnes, Wilson J.: *See—*
Lupinski, John H.; and Barnes, Wilson J., 3,855,169.

Barnett, Barry Roger Michael. Turnbuckle retainer. 3,854,173, Cl. 24-221.00r.

Barnett, George J.; Stanoy, Mark; and Watson, Robert L., to Domtar Limited. Pole corer. 3,854,838, Cl. 408-59.000.

Barr, Frederick E.: *See—*
Brenneman, Richard S.; Lovering, David W.; and Barr, Frederick E., 3,854,975.

Bartl, Herbert: *See—*
Alberts, Heinrich; Bartl, Herbert; and Kuhn, Rainer, 3,855,353.

Bartlett, David Ronald: *See—*
Ashall, Ronald James; and Bartlett, David Ronald, 3,854,988.

Bartling, Gerhard, to SKF Kugellagerfabriken GmbH. Method and apparatus for joining broken ends. 3,854,274, Cl. 57-34.00r.

Bartula, Richard J.: *See—*
McLean, Ronald L.; and Bartula, Richard J., 3,854,159.

Batdorf, Phillip N.: *See—*
Foral, Adolph J., Jr.; and Batdorf, Phillip N., 3,855,337.

Bateman, Charles H., Jr.; Campbell, Allan A.; and Capasso, James J., to Remington Arms Company, Inc. Vented test barrel assembly for revolver ammunition. 3,854,331, Cl. 73-167.000.

Bates, Clayton W., Jr.; and Eidson, John C., to Varian Associates. Image intensifier plate and method and compositions for manufacturing same. 3,855,035, Cl. 156-306.000.

Batesky, Donald C.; and Schultz, William C., to Eastman Kodak Company. Process for preparing N-tertiary-butoxycarbonyl amino acids. 3,855,238, Cl. 260-326.14t.

Bathellier, Andre; and Germain, Michel, to Commissariat a l'Energie Atomique. Method of purification of trilaurylamine. 3,855,298, Cl. 260-583.00n.

Battarel, Claude; and Nori, Jean-Pierre, to TECSI (Techniques et Systemes Informatiques). Register for propagating magnetic domains. 3,855,584, Cl. 340-174.0mc.

Battelle Memorial Institute: *See—*
Moore, Raymond H., 3,855,386.

Bauer, Carl: *See—*
Bauer, Carl Otto; Bode, Ernst; Diehl, Karl; and Rauhaus, Gerd, 3,854,350.

Bauer, Carl Otto; Bode, Ernst; Diehl, Karl; and Rauhaus, Gerd, to Bauer, Carl. Production of externally threaded bolts or the like with intersecting right-hand and left-hand helices. 3,854,350, Cl. 76-107.00r.

Bauer, Johann: *See—*
Kurz, Kieter; Bauer, Johann; Balwe, Thomas; Fendel, Kurt; and Sabel, Alex, 3,855,190.

Bauer, William H., to Filfast Corporation. Method of neutralizing a catalyzed aldehyde condensation resin foam. 3,855,161, Cl. 260-2.50f.

Baugh, Benton F., to Vetco Offshore Industries, Inc. Electromagnet control apparatus. 3,854,695, Cl. 251-129.000.

Bausch, Edmund: *See—*
Binder, Wilhelm; Hauer, Rudolf; and Bausch, Edmund, 3,855,486.

Baxter Laboratories, Inc.: *See—*
Feldman, Louis I., 3,855,065.
Kiesow, Kutz A., 3,854,878.

Baybrock, Howard E.; and Shivinsky, Joseph A., to Allegheny Ludlum Industries, Inc. Austenitic stainless steel. 3,854,938, Cl. 75-128.000.

Bayer Aktiengesellschaft: *See—*
Alberts, Heinrich; Bartl, Herbert; and Kuhn, Rainer, 3,855,353.
Frommer, Werner; Puls, Walter; and Schmidt, Delf, 3,855,066.
Maertens, Dieter; Witte, Josef; and Beck, Manfred, 3,855,361.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Stoepel, Kurt; and Bayer Aktiengesellschaft, 3,855,231.
Schon, Nikolaus; Schnoring, Hildegard; and Pampus, Gottfried, 3,854,981.
Wollweber, Hartmund; and Flucke, Winfried, 3,855,292.

BBC Brown, Boveri & Company, Ltd.: *See—*
Schueler, Claus, 3,855,017.

Beatrice Foods Company: *See—*
Kennedy, James D., 3,854,777.

Beck, Manfred: *See—*
Maertens, Dieter; Witte, Josef; and Beck, Manfred, 3,855,361.

Becker, Lothar; Kahr, Kurt; Rapp, Guenther; and Mannheim, Otto Waschka, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Recovery of caprolactam form oligomers by heating and film distillation. 3,855,080, Cl. 203-89.000.

Beckman Instruments, Inc.: *See—*
Leonard, Lynn B.; and Petersen, Arne J., 3,855,095.

Beckman, Joseph A.: *See—*
Lohr, Delmar F., Jr.; and Beckman, Joseph A., 3,855,164.

Becton, Dickinson and Company: *See—*
Rutner, Herman; Rapun, Raul; and Lewin, Nathan, 3,855,208.

Bedford, John A.: *See—*
Hobbs, Charles C.; and Bedford, John A., 3,855,319.

Beekhuis, Gerrit E., to Stamicarbon B.V. Preparation of gamma-cyanobutyraldehyde. 3,855,266, Cl. 260-465.100.

Beghnini, Gino P. Vacuum packaging. 3,854,618, Cl. 215-307.000.

Bell & Howell Company: *See—*
Kral, Fred; and Powers, Robert L., Jr., 3,855,619.

Bell, Curtis C.; and Forward, Robert L., to Hughes Aircraft Company. Rotating dynamic accelerometer. 3,854,340, Cl. 73-517.00r.

Bell, Oliver A., Jr.; and Gilleland, Randall C., to Colt Industries Operating Corporation. Gap sensing circuit for electrical discharge machining apparatus. 3,855,443, Cl. 219-69.00g.

Bell Telephone Laboratories, Incorporated: *See—*
Brendzel, Henry Tzvi; and Smith, Richard Allan, 3,855,423.
Condon, Joseph Henry, 3,855,537.
Kahn, Frederic Jay, 3,854,793.
Sinden, Frank William, 3,855,427.
Steidl, Robert Elling, 3,855,420.

Bellavita, Nera Cagnoli. Glycoside metabolites of oospora virescens wallr fungus. 3,855,067, Cl. 195-81.000.

Bellisle, Richard: *See—*
Mischke, Robert, 3,854,149.

Beloit Corporation: *See—*
Hill, Lester M., 3,855,057.

Bender, David M.: *See—*
Dolby, John Topping, 3,854,590.

Bendix Corporation, The: *See—*
Cutler, Hymie, 3,854,353.
Henegar, Hubert B., 3,854,660.
Reddy, Junuthula N., 3,854,458.

Benerito, Ruth R.: *See—*
Ward, Truman L.; Benerito, Ruth R.; and Berni, Ralph J., 3,854,868.
Ward, Truman W.; Benerito, Ruth R.; Berni, Ralph J.; and Soignet, Donald M., 3,854,867.

Bennet, Edward John: *See—*
Gibbs, Dudley Francis; Bennet, Edward John; and Hopkinson, William Ian, 3,854,703.

Benson, Robert D. Windshield washer. 3,854,161, Cl. 15-250.040.

Berger, Abe: *See—*
Wilkus, Edward V.; and Berger, Abe, 3,855,241.

Bergman, Imanuel, to National Research Development Corporation. Electrochemical cells. 3,855,096, Cl. 204-195.00p.

Bergwerksverband GmbH: *See—*
Kucharzyk, Werner, 3,855,073.
Romey, Ingo, 3,854,373.

Bernatt, Joseph; and Rogers, Edward J., to S&C Electric Company. High voltage switch arrangement. 3,855,433, Cl. 200-48.00r.

Berni, Ralph J.: *See—*
Ward, Truman L.; Benerito, Ruth R.; and Berni, Ralph J., 3,854,868.
Ward, Truman W.; Benerito, Ruth R.; Berni, Ralph J.; and Soignet, Donald M., 3,854,867.

Bernin, Victor Maurice, to Illinois Tool Works Inc. Angular velocity sensor. 3,855,525, Cl. 324-34.00d.

Bernstein, Seymour: *See—*
Dusza, John Paul; Lindsay, Harry Lee; and Bernstein, Seymour, 3,855,276.

Bertin & Cie: *See—*
Bertin, Jean Henri, 3,854,418.

Bertin, Jean Henri, to Bertin & Cie. Improvements in rack and pinion systems. 3,854,418, Cl. 105-29.00r.

Bertolazzi, Ugo, to Honeywell Information Systems Italia. Device for the automatic reversal of the lenghtwise motion of the ink-ribbon in typewriters and printers. 3,854,670, Cl. 242-67.400.

Bethea, Thomas J.; and Ritchie, Joe L., to Celanese Corporation. Mechanized bobbin handler. 3,854,275, Cl. 57-34.00r.

Betts Machine Company: *See—*
Pierson, Karl B., 3,854,623.

Beuch, Wallace Eric: *See—*
Amundson, Lonald Lloyd; Beuch, Wallace Eric; Green, Charles Donald; and Harris, William John, 3,855,457.

Bevilacqua, Frank: *See—*
Groves, Malcolm Duane; Bevilacqua, Frank; and Ferris, Daniel Ernest, 3,855,059.

Beyerle, Rudi; Stachel, Adolf; deceased (by Stachel, Ingeburg Lydia Katharina; executrix); Nitz, Rolf-Eberhard; and Scholtholt, Josef, to Cassella Farbwerke Mainkur Aktiengesellschaft. Basically substituted (1H, 3H)-quinazoline-2-thion-4-one derivatives. 3855,223, Cl. 260-256.50r.

Beyerle, Rudi; Stachel, Adolf; deceased (by Stachel, Ingeburg Lydia Katharina; executrix); Nitz, Rolf-Eberhard; and Scholtholt, Josef, to Cassella Farbwerke Mainkur Aktiengesellschaft. Basically substituted (1H, 3H)-quinazoline-2-thion-4-one derivatives. 3855,224, Cl. 260-256.50r.

Beyerle, Rudi; Stachel, Adolf; deceased (by Stachel, Ingeburg Lydia Katherina; executrix); Nitz, Rolf-Eberhard; and Scholtholt, Josef, to Cassella Farbwerke Mainkur Aktiengesellschaft. Basically substituted (1H,3H)-quinazoline-2-thion-4-one derivatives. 3,55,225, Cl. 260-256.50r.

Bibby, Malcolm M., to Monsanto Company. Method for detecting thermal changes on a surface. 3,854,336, Cl. 73-351.000.

Bieder, Marcel; and Leclert, Jean, to WABCO Westinghouse. Detector track circuit. 3,854,683, Cl. 246-40.000.

Bielskis, Edward C., to Patterson, C. J., Company. Method of increasing cold water solubility of locust bean gum. 3,855,149, Cl. 252-363.500.

Biesan, M. Michel: *See—*
Potin, M. Phillppe; and Biesan, M. Michel, 3,855,182.

Bieser, Herbert J.; and Uitti, Kenneth D., to Universal Oil Products Company. Distillation drying process. 3,855,077, Cl. 203-14.000.

Bildtsen, Sven Christian, to SKF Industrial Trading and Development Company B.V. Combined hydrostatic bearing and rolling bearing. 3,854,781, Cl. 308-35.000.

Billany, Michael Royston; Longworth, Arthur Raymond; and Shatwell, John, to Imperial Chemical Industries Limited. Cleansing compositions. 3,855,140, Cl. 252-106.000.

Billings, William G., to Phillips Petroleum Company. Hydrogenation of unsaturated compounds. 3,855,327, Cl. 260-668.00d.

Bilow, Norman, to Hughes Aircraft Company. Polyamic acids and esters. 3,855,273, Cl. 260-471.00r.

Binder, Horst; Kohling, Alfons; and Kuhn, Wolfgang. Gas electrodes. 3,854,994, Cl. 117-216.000.

Binder Magnete GmbH: *See—*
Binder, Wilhelm; Hauer, Rudolf; and Bausch, Edmund, 3,855,486.

Binder, Robert, to Porche, h.c.F., Dr.-Ing., KG, Firma. Mixture preparation installation for a multi-cylinder injection internal combustion engine. 3,854,462, Cl. 123-119.00r.

Binder, Wilhelm; Hauer, Rudolf; and Bausch, Edmund, to Binder Magnete GmbH. Step motor. 3,855,486, Cl. 310-49.000.

Bird Machine Company, Inc.: *See—*
Russell, Robert H., 3,854,162.

Birtton, Leon R.; Vojir, Frank S.; and Wright, William W., to Guardian Electric Manufacturing Company. Push button pulse signal generator. 3,855,488, Cl. 310-8.300.

Bishop, Bill H.; and Shaw, Jack R. Postal drop box. 3,854,656, Cl. 232-27.000.

Bishop, Clyde E., to Continental Oil Company. Isomerization of α-epoxides. 3,855,303, Cl. 260-593.00r.

Bishop, Harry L., Jr., to Allegheny Ludlum Industries, Inc. Process for production of stainless steel. 3,854,932, Cl. 75-60.000.

Black, Sivalls & Bryson, Inc.: *See—*
Foral, Adolph J., Jr.; and Batdorf, Phillip N., 3,855,337.

Blair, Calvin B. Fertilizer dispenser. 3,854,429, Cl. 111-7.000.

Blanc, Jean Henri: *See—*
Mendelsohn, Jean Claude; and Blanc, Jean Henri, 3,855,330.

Blank, Fritz, to Coulter Electronics, Inc. Magnetic hopper system. 3,854,602, Cl. 214-6.0ba.

Blieberger, Rudolf. Ejecting device. 3,854,629, Cl. 222-109.000.

Bliss, Denys Stanley, to Bliss Pendair Limited. Tracked air cushion vehicles. 3,854,403, Cl. 104-23.0fs.

Bliss Pendair Limited: *See—*
Bliss, Denys Stanley, 3,854,403.

Blochlinger, Ernst, to Schweizerische Industrie-Gesellschaft. Guide system for vehicle carriages. 3,854,409, Cl. 104-130.000.

Blue Bell, Inc.: *See—*
Bryan, Carney J., 3,854,430.

Blue Ribbon Industries, Inc.: *See—*
Baillie, William R., 3,855,413.

Blunden, Donald J.; and Peisner, Israel D., to Whitehead & Kales Company. Tie-down and locking system. 3,854,424, Cl. 105-368.00t.

BMR Security Products Corporation: *See—*
Walters, Russell W., 3,854,603.

Boalen, Kenneth C.: *See—*
Lindsay, Arwin O.; and Boalen, Kenneth C., 3,854,252.

Bobst, J., & Fils, S.A.: *See—*
Mueller, Pierre, 3,854,642.

Bochumer Eisenhutte Heintzmann & Co.: *See—*
Spies, Klaus, 3,854,293.

Bock, Heinrich: *See—*
Steinhart, Gilbert; and Bock, Heinrich, 3,854,569.

Bode, Ernst: *See—*
Bauer, Carl Otto; Bode, Ernst; Diehl, Karl; and Rauhaus, Gerd, 3,854,350.

Bodenseewerk Geratetechnik GmbH: *See—*
Schwarz, Karlhans, 3,855,466.

Boehringer Ingelheim GmbH: *See—*
Renth, Ernst-Otto; Schromm, Kurt; and Mentrup, Anton, 3,855,062.

Boehringer Mannheim GmbH: *See—*
Rathje, Werner, 3,854,880.

Boehringer, Wilfred E.; and Walker, James V., to McDonnell Douglas Corporation. Multi-stage brake valve. 3,854,780, Cl. 303-21.00f.

Boeing Company, The: *See—*
Foster, Gene B., 3,854,215.
Klees, Garry W., 3,854,286.

Boettcher, Winfried, to VEB Polygraph Leipzig, Kombinat Fuer Polygraphische Maschinen und Ausrustungen. Apparatus for heat-sealing superimposed layers of sheet material. 3,855,039, Cl. 156-521.000.

Bohler, Walter; and Smith, Duane L., to Perkin Elmer Corporation, The. Signal peak detection arrangement for atomic absorption spectrometry. 3,854,818, Cl. 356-85.000.

Bohme, Ekkehard: *See—*
Dolfini, Joseph Edward; Bohme, Ekkehard; and Slusarchyk, William A., 3,855,233.

Boisseau, Jean-Francois, to Office National d'Etudes et de Recherches Aerospatiales (par abreviation O.N.E.R.A.). Vibration generator for studying structures. 3,855,487, Cl. 310-80.000.

Bokuda, Yoshiyuki: *See—*
Kanno, Isawo; Takashima, Toshiyuki; and Bokuda, Yoshiyuki, 3,855,055.

Boldrev, Sergei Andreevich: *See—*
Medem, Vulf Matveevich; Boldrev, Sergei Andreevich; Karpenko, Leonty Petrovich; Dolukhanov, Rafik Tsaturovich; and Sergeev, Nikolai Sergeevich, 3,855,116.

Boldridge, Austin G., Jr.: *See—*
Hoisington, Perry M.; and Boldridge, Austin G., Jr., 3,854,909.

Bolen, Robert J.: *See—*
Whitney, Paul V., Jr.; Bolen, Robert J.; and Cotter, William W., Jr., 3,854,898.

Boler, Leonard J., to Cherne Industrial, Inc. Liquid cooling apparatus. 3,855,369, Cl. 261-90.000.

Bolez, Carl A.: *See—*
Switzer, George; and Bolez, Carl A., 3,854,896.

Boliden Aktiebolag: *See—*
Gorling, Karl Goran, 3,854,931.

Bolton-Emerson, Inc.: *See—*
Park, George C., 3,854,441.

Bolz, Walter; Herzog, Horst; Herzog, Alfred; and Neese, Hans J., to Doduco, Eugen Durrwachter, Dr. Continuous strip electroplating apparatus. 3,855,108, Cl. 204-206.000.

Bonanno, Anthony J.: *See—*
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 3,855,079.

Bondiek, Rolf: *See—*
Muller, Gerhard; and Bondiek, Rolf, 3,855,554.

Bongartz, Paul: *See—*
Locher, Otto; Haag, Franz; and Bongartz, Paul, 3,855,148.

Booker, Clyde A., Jr., to Westinghouse Electric Corporation. Elevator system. 3,854,554, Cl. 187-29.00r.

Boots Company Limited, The: *See—*
Adams, Stuart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,855,406.

Bopp & Reuther GmbH: *See—*
David, Walfried, 3,854,761.

Borg-Warner Corporation: *See—*
Burroughs, James E.; and Hoppesch, Joseph P., 3,854,319.
Burroughs, James E.; Seibert, John W.; and Hoppesch, Joseph P., 3,854,320.
Wills, Frank E., 3,855,482.

Borgeaud, Gaston: *See—*
Hinnen, Hermann; and Borgeaud, Gaston, 3,854,420.

Borisuck, John F.; and La Chall, Reuben A., to Uniroyal, Inc. Footwear having a two-color rubber sole. 3,854,227, Cl. 36-4.000.

Bosch, Robert, G.m.b.H.: *See—*
Adam, Helmut; Ortlieb, Alfred; and Traub, Eberhard, 3,854,442.
Forster, Herbert, 3,854,182.
Herrmann, Walter; Geisler, Heinrich; and Hofer, Friedrich-Wilhelm, 3,854,289.
Paule, Kurt; Zilly, Gunter; and Reiss, Willy, 3,854,203.
Steinberg, Diedrich; Johnke, Winfried; Roth, Helmut; Ruf, Walter; Steinbrenner, Ulrich; and Linstedt, Hans, 3,854,466.

Boskus, Charles W., Jr. Hose cutting device. 3,854,205, Cl. 30-231.000.

Bosse, Frank, to Windmoller & Holscher. Welding cylinder with peripherally extending welding band. 3,855,025, Cl. 156-582.000.

Bossert, Friedrich: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Stoepel, Kurt; and Bayer Aktiengesellschaft, 3,855,231.

Bosshardt, Ernst, to Sulzer Brothers Ltd. Plant for treating water, in particular sewage or sludge. 3,854,875, Cl. 21-102.00r.

Bostick, Edgar E.; and Gilbert, Alfred R. Crosslinking of aromatic polymers with organic polysulfonazides. 3,855,184, Cl. 260-79.30r.

Botcherby, Stephen Charles Lauder, to DECCA Limited. Multiple frequency continuous wave radars. 3,855,594, Cl. 343-7.500.

Boudewyn, Robert H. Floor drain. 3,854,151, Cl. 4-288.000.

Bourganel, Jack, to Rhone-Poulenc S.A. Process for the preparation of anisotropic semi-permeable membranes of polyaryl ether/sulphones. 3,855,122, Cl. 210-23.000.

Bouvaist, Pierre. Arrangement for securing an attachment, such as a spray pump, to the neck of a bottle. 3,854,633, Cl. 222-183.000.

Bouwhuis, Gijsbertus, to U.S. Philips Corporation. Video disc recording and optical playback system therefor. 3,855,426, Cl. 179-100.30v.

Boux, Joseph F., to General Concrete of Canada Limited. Floor building system. 3,855,375, Cl. 264-35.000.

Bowman, Clyde L., to Rapistan Incorporated. Eccentric wheel accumulators. 3,854,576, Cl. 198-184.000.

Bowman, Harold M. Paving compositions and methods of making same. 3,855,167, Cl. 260-28.000.

Bowness, Colin, to Raytheon Company. Frequency selective output coupling for lasers. 3,855,544, Cl. 331-94.500.

Boyer, Robert Allan; and Chen, Anthony Hing, to Miles Laboratories, Inc. Process for treating continuous filaments. 3,854,870, Cl. 8-139.000.

Boyle, Jamie N.; and Decker, Edmund C., Jr., to Honeywell Information Systems, Inc. Quick-release standoff and support device. 3,854,374, Cl. 85-84.000.

BP Chemicals Limited: *See—*
Brown, Christopher John; and Neale, Roderick F., 3,855,081.

Brackmann, Warren A.; Bunnell, Arthur K.; and Hrboticky, Karel, to O'Keefe, Carling, Limited. Blank for container cover. 3,854,652, Cl. 229-43.000.

Bradbury, Bernard G., to Rexnord Inc. Power merge-synchronous. 3,854,414, Cl. 104-172.000.

Braden, William B., Jr., to Texaco Inc. Enriched gas drive recovery process. 3,854,532, Cl. 166-274.000.

Bradley, Orval C. Skinning tree. 3,854,168, Cl. 17-44.200.

Brady, William S., to Babcock & Wilcox Company, The. Impaled and compressed fibrous furnace lining. 3,854,262, Cl. 52-404.000.

Braelow, David B.: *See—*
Kimmelmann, Carl E., 3,855,441.

Brailowsky, Vladimir; and Alson, Erwin A., to General Motors Corporation. Method of making magnetically-anisotropic permanent magnets. 3,855,374, Cl. 264-24.000.

Brammall Inc.: *See—*
Van Gompel, James J., 3,854,312.

Brandell, John R. Golf putting game device. 3,854,728, Cl. 273-179.00a.

Bratt, Geoffrey Charles, to Electrolytic Zinc Company of Australasia Limited. Process for production of tribasic lead sulphate monohydrate. 3,855,402, Cl. 423-559.000.

Brauer, Karl-Heinz: *See—*
Stark, Karl; Achterwinter, Werner; and Brauer, Karl-Heinz, 3,854,247.

Braun, David B.: *See—*
Harris, Edward B.; and Braun, David B., 3,855,357.

Braun, William V.; Bruckert, Eugene J.; Giacomino, Gerald L.; and Partipilo, Phillip, to Motorola, Inc. Asynchronous internally clocked sequential digital word detector. 3,855,576, Cl. 340-146.200.

Breen Alvin L.; and Lauterbach, Herbert G., to Du Pont de Nemours, E. I., and Company. Process and apparatus for texturing yarn. 3,854,177, Cl. 28-1.400.

Brendzel, Henry Tzvi; and Smith, Richard Allan, to Bell Telephone Laboratories, Incorporated. Noise spectrum equalizer. 3,855,423, Cl. 179-15.55r.

Brenneman, Richard S.; Lovering, David W.; and Barr, Frederick E., to Addressograph-Multigraph Corporation. Pressure fixing of toners. 3,854,975, Cl. 117-21.000.

Breu, Karl-Jan; Hoher, Herbert; and Schinke, Hans-Joachim, to Siemens Aktiengesellschaft. Arrangement for the operation of switching devices in telephone equipment. 3,855,438, Cl. 200-153.00r.

Breuer, Hermann; and Treuner, Uwe, to Squibb, E. R., & Sons, Inc. Cyanomethylthioacetylcephalosporins. 3,855,212, Cl. 260-243.00c.

Bridge, John. Rail car trailer hitch and container mount. 3,854,423, Cl. 105-368.00b.

Bridgestone Tire Company Limited: *See—*
Takemura, Satoshi; Maeda, Mitsuaki; and Sakai, Noboru, 3,854,515.

Brie, Michel; and Riess, Gerard, to Commissariat a L'Energie Atomique. Method of manufacture of composite materials consisting of carbon fibers and resin and materials thus obtained. 3,855,174, Cl. 260-40.00r.

Brielle, Maurice G., to Regie Nationale des Usines Renault. Distribution of valve-gear systems for rotary machines. 3,854,849, Cl. 418-61.00b.

Bristow, Norman William: *See—*
Adams, Stewart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,855,244.
Adams, Stuart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,855,406.

British Aluminium Company Limited, The: *See—*
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British Petroleum Company, Limited, The: *See—*
Cracknell, John Roland; and Gorszek, Aleksander Jerzy, 3,855,117.

British Steel Corporation: *See—*
Hetherington, Matthew James; and Atkinson, Peter, 3,854,326.

Brock, Robert J., to Kimberly-Clark Corporation. Self-sized patterned bonded continuous filament web. 3,855,045, Cl. 161-146.000.

Brockmiller, Charles Anthony; Lund, Robert E.; and Fitzsimmons, John Edward, to St. Joe Minerals Corporation. Method for removing mercury from industrial gases. 3,855,387, Cl. 423-210.000.

Brodnyan, John G., to Rohm and Haas Company. Flameproof covering material, such as ticking. 3,854,983, Cl. 117-68.000.

Brody, Philip S., to United States of America, Army. Method of producing current with ceramic ferroelectric device. 3,855,004, Cl. 136-89.000.

Brookes, William Ronald, 20% to Lee, Raymond, Organization, Inc., The. Collapsible hoisting apparatus. 3,854,594, Cl. 212-56.000.

Broome, Joseph W. Twin tube car drive. 3,854,413, Cl. 104-166.000.

Brosier, Richard H. Apparatus for improving bowling skill. 3,854,718, Cl. 273-41.000.

Broszeit, Jurgen, to Gerdts, Gustav F., KG. Return valve. 3,854,496, Cl. 137r540.000.

Broussard, Douglas E.; Hemphill, Dean P.; Kolb, Robert H.; and Macy, Robert H., to Shell Oil Company. Method and apparatus for laying marine pipelines. 3,854,297, Cl. 61-72.300.

Brown & Williamson Tobacco Corporation: *See—*
Luke, John A., 3,855,032.
Naylor, Donald B., 3,854,384.

Brown, Christopher John; and Neale, Roderick F., to BP Chemicals Limited. Chemical process. 3,855,081, Cl. 203-91.000.

Brown, David, Tractors Limited: *See—*
Hull, Charles Hartley, 3,854,543.

Brown, Edward A., to Searle, G. D., & Co. 9α,11α-Epoxy spirolactones, spirolactols and lactol ethers corresponding. 3,855,207, Cl. 260-239.55r.

Brown, Harold J., to Lorain Products Corporation. D-C current measuring circuit. 3,855,528, Cl. 324-117.00r.

Brown, Leon H., Jr.: *See—*
Chur, Sung Pal; and Brown, Leon H., Jr., 3,855,623.

Brown, William B.: *See—*
Campbell, Gregory A.; and Brown, William B., 3,855,106.

Browning, Paul T., III. Fishing lure. 3,854,233, Cl. 43-42.290.

Broxholm, Thomas M.: *See—*
Elmore, Lester C.; and Broxholm, Thomas M., 3,854,376.

Broyles, Howard F. Electrically fired multiple barrel superimposed projectile weapon system. 3,854,231, Cl. 42-84.000.

Bruckert, Eugene J.: *See—*
Braun, William V.; Bruckert, Eugene J.; Giacomino, Gerald L.; and Partipilo, Phillip, 3,855,576.

Bruer, Hermann; and Treuner, Uwe D., to Squibb, E. R., & Sons, Inc. Dithiocarbonylaminoacetyl cephalosporins. 3,855,211, Cl. 260-243.00c.

Brundage, R. Pauline; and Lesher, George Y., to Sterling Drug Inc. Preparation of 1-(lower-alkyl)-1,4-dihydro-7-methyl-4-oxo-1, 8-naphthyridine-3-carboxylate. 3,855,232, Cl. 260-295.50b.

Brundell och Jonsson AB: *See—*
Matlik, August, 3,854,510.

Brunner, Julius, to Siemens Aktiengesellschaft. Perforated-tape reader drive system. 3,855,513, Cl. 318-561.000.

Bryan, Carney J., to Blue Bell, Inc. Material handling apparatus and method. 3,854,430, Cl. 112-121.110.

Bryan, Paul J.; and McConnell, Ronald F., to Du Pont de Nemours, E. I., and Company. Controlled opening, variable orifice, explosively actuated valve. 3,854,491, Cl. 137-1.000.

Bucalo, Louis, to Investors in Ventures, Inc. Female contraceptive devices. 3,854,475, Cl. 128-130.000.

Bucherl, Erwin; and Peters, Walter, to Siemens Aktiengesellschaft. Frequency selective circuit arrangements. 3,854,659, Cl. 333-28.00r.

Buchner, Stanisulaus; and Fischer, Dragica, to Solco Basel AG. Method of producing glucofrangulin of technical purity. 3,855,201, Cl. 260-210.00f.

Buckland, William J., Jr.; and O'Daly, Kevin C., to Product Potentials, Inc. Time reminding machine. 3,855,588, Cl. 340-309.400.

Buckman, Stanley J.; and Pulido, Miguel L. Method for increasing yield of sugarcane. 3,854,928, Cl. 71-121.000.

Bucyrus-Erie Company: *See—*
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Bulk Unit Load Systems Limited: *See—*
Snape, George W., 3,854,612.

Bullard, Raymond S.: *See—*
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Bunker Ramo Corporation: *See—*
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Bunnell, Arthur K.: *See—*
Brackmann, Warren A.; Bunnell, Arthur K.; and Hrboticky, Karel, 3,854,652.

Burden, Henry Owen, Sr. Efficiency increasing anti-pollution control device. 3,854,463, Cl. 123-133.000.

Buret, Jean Pierre: *See—*
Hirsch, Jean; and Buret, Jean Pierre, 3,855,197.

Burger, Charles R.: *See—*
Salloga, Fred W.; and Burger, Charles R., 3,854,697.

Burgess, James F.; and Neugebauer, Constatine A., to General Electric Company. Direct bonding of metals with a metal-gas eutectic. 3,854,892, Cl. 29-196.100.

Burgess, John E.; Dieball, Kenneth C.; and Obrycki, Raymond F., to Searle, G. D., & Co. Radioactivity measuring device with a movable detector head. 3,855,473, Cl. 250-328.000.

Burke, Oliver W., Jr. Silica pigments and preparation thereof. 3,855,394, Cl. 423-339.000.

Burke, Patrick Michael, to Du Pont de Nemours, E. I., and Company. Methylolphosphoric triamides. 3,855,288, Cl. 260-551.00p.

Burkhard, Mahlon D.; and Peters, Richard W., to Industrial Research Products, Inc. Delta modulator having low-level random noise characteristic. 3,855,555, Cl. 332-11.00d.

Burleigh, John E.: *See—*
Uraneck, Carl A.; and Burleigh, John E., 3,855,188.

Burnell, Hughie, to Kenrick, Archibald, & Sons Limited. Vehicle wheels. 3,854,516, Cl. 152-415.000.

Burnett Company, Ltd.: *See—*
Burnett, Ralph G., 3,854,767.

Burnett, Ralph G., to Burnett Company, Ltd. Rope assembly. 3,854,767, Cl. 294-74.000.

Burnham, John, to Hughes Aircraft Company. Solid dielectric capacitors and method. 3,854,980, Cl. 117-61.000.

Burroughs, James E.; and Hoppesch, Joseph P., to Borg-Warner Corporation. Alcoholic breath simulator. 3,854,319, Cl. 73-1.00r.

Burroughs, James E.; Seibert, John W.; and Hoppesch, Joseph P., to Borg-Warner Corporation. Quiescent breath testing system. 3,854,320, Cl. 73-23.000.

Burroughs, Wellcome Co.: *See—*
Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., 3,855,265.

Burtis, Carl A.; Johnson, Wayne F.; and Walker, William A., to United States of America, Atomic Energy Commission. Automated sample-reagent loader. 3,854,508, Cl. 141-130.000.

Bush, Donald M., to United States of America, Atomic Energy Commission. Thermal sensing, fire safing device for a thermal battery. 3,855,003, Cl. 136-83.00t.

Bush, Walter Monroe; and Reardon, Daniel Francis, to Eastman Kodak Company. Shifted indophenol dye developers. 3,854,945, Cl. 96-29.00d.

Bussell, George W., to Inmont Corporation. Maleinized fatty acid esters of 9-oxatetracyclo-4.4.1^{2,5}0^{1,6}0^{8,10}undecan-4-ol. 3,855,163, Cl. 260-18.0ep.

Buttone, Larry J.: *See—*
Buttone, Valsin J.; and Buttone, Larry J., 3,854,513.

Buttone, Valsin J.; and Buttone, Larry J. Internal wheel safety device for vehicles. 3,854,513, Cl. 152-158.000.

Cadiou, Jean Jacques; Guerinet, Georges Rene; Callens, Paul Raymond; and Tracol, Andre G., to International Business Machines Corporation. Time division multiplexer with each frame consisting of a fixed length bit oriented address field and a variable lengh character oriented data field. 3,855,422, Cl. 179-15.0al.

Cahill, Paul J., to Standard Oil Company. Alkenyl-substituted succinic anhydride. 3,855,251, Cl. 260-346.80r.

Cailliot, Sege Leon Louis, 1/2 to Tcherkassky, Georges. Cartridge for endless coil of tape. 3,854,669, Cl. 242-55.19a.

Caligen Foam Limited: *See—*
Bagnall, Raymond, 3,855,048.

Callens, Paul Raymond: *See—*
Cadiou, Jean Jacques; Guerinet, Georges Rene; Callens, Paul Raymond; and Tracol, Andre G., 3,855,422.

Cameron, Frank L.; and Miller, Harold L., to Westinghouse Electric Corporation. Circuit interrupter. 3,855,563, Cl. 337-221.000.

Cameron Iron Works, Inc.: *See—*
Oliver, John P.; Wedel, Alfred W.; and Priesmeyer, Paul T., 3,854,211.

Camozzi, Antonio: *See—*
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Campbell, Allan A.: *See—*
Bateman, Charles H., Jr.; Campbell, Allan A.; and Capasso, James J., 3,854,331.

Campbell, Gregory A.; and Brown, William B., to General Motors Corporation. Process for electrodeposition of paint. 3,855,106, Cl. 204-181.000.

Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Staffier, Thomas L., to Johnson & Johnson. Method for manufacturing a non-slip waistband product. 3,854,978, Cl. 117-44.000.

Campbell, Ronald J.: *See—*
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Campbell, Ronald R.: *See—*
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Campbell, Thomas C.: *See—*
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Canci, Daniel G. Meal service set. 3,854,624, Cl. 221-96.000.

Canon Kabushiki Kaisha: *See—*
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Hanagata, Takayoshi; and Yamada, Suminobu, 3,855,448.
Nishikawa, Tatsuo; and Ozawa, Toshiaki, 3,854,560.
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Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 3,855,601.
Yamaji, Keizo; Katayama, Hajime; Takahashi, Toru; Ohashi, Shoji; and Nishigaki, Yuji, 3,854,224.
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Cantella, Emiliano, to Atom de Cantella-Deambrosis & Gaia. Hydraulic control system for hollow punching machines. 3,854,362, Cl. 83-530.000.

Capasso, James J.: *See—*
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Carder, Victor H., to Cochran-Boothe Airport Systems. Freight transporter and loader for aircraft. 3,854,610, Cl. 214-520.000.

Cardwell, Paul H.: *See—*
McCutchen, Hugh L.; and Cardwell, Paul H., 3,855,089.

Cardwell, Paul H.; and Olander, James A. Method for separating nickel from cobalt in aqueous solution. 3,854,851, Cl. 423-24.000.

Carlen, Jan-Christer Henric Ovesson: *See—*
Merkell, Karl Ake; and Carlen, Jan-Christer Henric Ovesson, 3,854,363.

Carlin, Joseph T., to Texaco Inc. Viscous petroleum recovery process. 3,854,531, Cl. 166-272.000.

Carlise, Robert L., to Rockwell International Corporation. Phase-scanned radiating array. 3,855,597, Cl. 343-768.000.

Carlson, David John, to RCA Corporation. Transistor oscillator with diode in feedback circuit providing amplitude stabilization. 3,855,550, Cl. 331-109.000.
Carmichael, Paul D.: *See—*
Pogonowski, Ivo C.; and Carmichael, Paul D., 3,854,296.
Caron, Ronald N.: *See—*
Shapiro, Stanley; and Caron, Ronald N., 3,855,012.
Carr, David L., to Texas Instruments Incorporated. Folded lobe large optical cavity laser diode. 3,855,546, Cl. 331-94.50h.
Carr, Noel Gordon: *See—*
Oldham, Kenneth Gordon; and Carr, Noel Gordon, 3,854,240.
Carrier Corporation: *See—*
Dempster, James W., 3,854,397.
Carruth, Edwin I. All-purpose massager. 3,854,474, Cl. 128-33.000.
Carsch, Elke, nee Saxen: *See—*
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Carson, Don B.; Orfanedes, Steven R.; and Zentner, Kurt J., Jr., to Universal Oil Products Company. Heating system providing controlled convective heating. 3,854,455, Cl. 122-356.000.
Carter, D. Charles, to Monsanto Research Corporation. Condensate trap. 3,854,298, Cl. 62-55.500.
Carter, Russell W., to Corn States Metal Fabricators, Inc. Method and apparatus for forming a tire. 3,854,852, Cl. 425-40.000.
Cartiere Paolo Pigna S.p.A.: *See—*
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Cascade Corporation: *See—*
Hayes, Charles T.; Faust, Donald M.; and Weinert, Harry F., 3,854,606.
Casey, Robert, to Caterpillar Tractor Company. Three-way lever control for hydraulic control circuit. 3,854,380, Cl. 91-413.000.
Cashen, Norton A.: *See—*
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Casio Computer Co., Ltd.: *See—*
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Beyerle, Rudi; Stachel, Adolf; Nitz, Rolf-Eberhard; and Scholtholt, Josef, 3,855,224.
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Flint, Walker H.; and Haedicke, Gerald R., 3,854,752.
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Schexnayder, Lawrence F., 3,854,381.
Catherwood, Billy Reid: *See—*
Conley, Robert F.; Catherwood, Billy Reid; and Lloyd, Mary Kate, 3,854,971.
Caudill, Corbett D., to General Electric Company. Rotor blade having improved tip cap. 3,854,842, Cl. 415-116.000.
Caughlin, James Daniel, to Ginners Incorporated. Cotton lint cleaner. 3,854,170, Cl. 19-202.000.
Celanese Corporation: *See—*
Bethea, Thomas J.; and Ritchie, Joe L., 3,854,275.
Hobbs, Charles C.; and Bedford, John A., 3,855,319.
Severs, Glen Maurice, Jr., 3,855,280.
Centrala Industriala de Fibre Chimice: *See—*
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Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See—*
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Chvalovsky, Vaclav; Mach, Lumir; and Machova, Helena, 3,854,986.
Prochazka, Jaroslav; and Rod, Vladimir, 3,855,368.
Chang, Gerald M., to Reichhold Chemicals, Inc. Unsupported catalyst for the oxidation of methanol to formaldehyde. 3,855,153, Cl. 252-470.000.
Chapman, Donald L. Carburetor. 3,855,366, Cl. 261-41.00b.
Chapman, Norman Bellamy; Clarke, Kenneth; and James, John William, said James assor. to Aspro-Nicholas Limited. Benza [b] thiemyl-alkyl-granidines. 3,855,242, Cl. 260-330.500.
Chase Corporation: *See—*
Lania, Anthony R.; Chase, Edward L.; Chase, Francis M.; Graham, Leonard P.; and Murray, James E., 3,855,051.
Chase, Edward L.: *See—*
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Chase, Francis M.: *See—*
Lania, Anthony R.; Chase, Edward L.; Chase, Francis M.; Graham, Leonard P.; and Murray, James E., 3,855,051.
Check, John M.; and Rupert, Gary F., to Raycon Corporation. Electrode supporting cartridge assembly for electrical discharge machining apparatus. 3,855,442, Cl. 219-69.00e.
Chemetron Corporation: *See—*
Van Horn, Charles A., 3,855,011.
Chemprene, Inc.: *See—*
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Cheron, Jacques, to Institut Francais du Petrole des Carburants et Lubrifiants. Fuel cell with air purifier. 3,855,001, Cl. 136-86.00c.
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Singer, Malcolm Scott, 3,854,925.
Chez, David A., to Ziskin, Harold A. Apparatus for transferring patients. 3,854,152, Cl. 5-81.00r.
Chierico, Massimo A., to A-1 Sewing Center. Opening means for button-holding accessory to sewing machine. 3,854,431, Cl. 112-114.000.
Childs, John D.: *See—*
Halasz, Andrew; Childs, John D.; and Fraser, George H., 3,855,506.
Childs, William V., to Phillips Petroleum Company. Apparatus and method for separating tetraalkylammonium salt. 3,855,269, Cl. 260-465.900.
Chivinsky, Joseph A., to Allegheny Ludlum Industries, Inc. Titanium composite. 3,854,891, Cl. 29-196.000.
Chopdekar, Vilas M., to M&T Chemicals Inc. Method for preparing phosphorus compounds. 3,855,310, Cl. 260-606.50p.
Chope, Henry Roy, to Industrial Nucleonics Corporation. System for effectively enlarging a detector window. 3,855,467, Cl. 250-219.00q.
Christy, Betty L.: *See—*
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Church, Herman S.; Hagener, James L.; and Scifres, Zach M., III, to Teledyne Mid-America Corporation. Heavy-duty vehicle bumper mount construction. 3,854,765, Cl. 293-88.000.
Chvalovsky, Vaclav; Mach, Lumir; and Machova, Helena, to Ceskoslovenska akademie ved. Method of making mineral fibers of high corrosion resistance and fibers produced. 3,854,986, Cl. 117-126.0gs.
Ciba-Geigy AG: *See—*
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Ciciora, Walter S., to Zenith Radio Corporation. Anti-pairing system for a television receiver. 3,855,496, Cl. 315-393.000.
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Cloud, Charles E.; and Hartman, Donn Allan, to Cloud Machine Corporation. Apparatus for automatically erecting and loading cartons. 3,854,270, Cl. 53-159.000.
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Cluck, Perry U. Electric chess game boards. 3,854,725, Cl. 273-131.00a.
Cluwen, Johannes Meijer: *See—*
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Coate, Forrest M., to United States of America, Air Force. Method and means for determining fatigue damage and surface stress. 3,854,325, Cl. 73-67.600.
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Cobb, Raymond L., to Phillips Petroleum Company. Aluminum phosphate-promoted catalysts for the ammonialytic cleavage of lactams. 3,855,267, Cl. 260-465.200.

Cochran-Boothe Airport Systems: *See*—
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Cochrane, Peter R., to General Electric Company. Forced contact electrical connector. 3,855,568, Cl. 339-95.00r.

Cocroft, Kelly H., to Skytram Systems, Inc. Aerial tramway vehicle drive and control system. 3,854,407, Cl. 104-112.000.

Cocroft, Kelly H., to Skytram Systems, Inc. Aerial tramway drive assembly. 3,854,419, Cl. 105-153.000.

Cohen, Alfred. Apparatus for determining organic carbon content of polluted liquids. 3,854,881, Cl. 23-253.0pc.

Cohen, Elliott; and Paul, Rolf, to American Cyanamid Company. Levo 1-amino-3-chloro-2-propanol and acid addition salts thereof. 3,855,283, Cl. 260-501.170.

Cohen, Harry, 20% to Lee, Raymond, Organization, Inc., The. Plumb bob and level. 3,854,218, Cl. 33-358.000.

Colado, Joseph J.; and Turner, Norman G., to Superior Concrete Accessories, Inc. Articulated hold-down anchor device for the embedded cables of a prestressed concrete girder. 3,854,258, Cl. 52-226.000.

Colardelle, Joel Serge; Girard, Pierre; and Lerouge, Claude Paul Henri, to International Standard Electric Corporation. Electronic hybrid circuit for two-wire to four-wire interconnection. 3,855,430, Cl. 179-170.0nc.

Cole, Edward L.: *See*—
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Cole, Robert R.; and Bullard, Raymond S., to Royal Industries, Inc. Tank. 3,854,526, Cl. 165-71.000.

Coleman, John F., to Xerox Corporation. Cam. 3,854,715, Cl. 271-277.000.

Colitti, Olindo A.: *See*—
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Colt Industries Operating Corporation: *See*—
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Combustion Engineering, Inc.: *See*—
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Conard, Wendell Reed, to Firestone Tire and Rubber Company, The. Curing resinous homopolymers and copolymers of butadiene of high 1,2-configuration. 3,855,194, Cl. 260-94.70a.

Conde, Hector O., to United States of America, Health, Education and Welfare. Unidirectional slip clutch. 3,854,561, Cl. 192-48.920.

Condon, Joseph Henry, to Bell Telephone Laboratories, Incorporated. Band-separation filter with reduced path cross-connections. 3,855,537, Cl. 328-167.000.

Confides, James J.: *See*—
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Conley, Robert F.; Catherwood, Billy Reid; and Lloyd, Mary Kate, to Georgia Kaolin Company. Satin white-clay compositions and methods of manufacture. 3,854,971, Cl. 106-214.000.

Conner, Donald E.: *See*—
Zak, Henry; and Conner, Donald E., 3,855,290.

Conroy, Robert E. Athletic armor and inflatable bag assembly. 3,854,228, Cl. 36-71.000.

Consolidated Natural Gas Service Co., Inc.: *See*—
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Constellation Corporation: *See*—
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Continental Oil Company: *See*—
Bishop, Clyde E., 3,855,303.
Leach, Bruce E.; and Motz, Kaye L., 3,855,320.

Conway, John J.; and Evesque, Roger A., to Jonson, S. C., & Son, Inc. Aerosol valve for low delivery rate. 3,854,636, Cl. 222-402.240.

Cooley, Richard F., to Owens-Illinois, Inc. Laser glass host compositions comprising TeO_2,BaO, Li_2O. 3,855,545, Cl. 331-94.50e.

Coone, Malcolm G. Apparatus for an aggregate pump. 3,854,694, Cl. 251-5.000.

Coons, Uzal E., to Wrigley, Wm., Jr., Company. Method and apparatus for discharging measured amounts of dough. 3,854,627, Cl. 222-1.000.

Cooper Industries, Inc.: *See*—
Angquist, Torsten F., 3,854,354.

Cooper, Thomas H., to Combustion Engineering, Inc. Gate valve. 3,854,500, Cl. 137-601.000.

Copeland, Claude T.: *See*—
Gurley, Derrel G.; and Copeland, Claude T., 3,854,533.

Coppock, Walter J.: *See*—
Newingham, Thomas D.; Amaroso, James R.; Coppock, Walter J.; and Williams, Edward S., 3,855,135.

Copyer Co., Ltd.: *See*—
Konno, Minoru; and Ichiki, Mitsuo, 3,854,344.

Coran, Aubert Yaucher; and Kerwood, Joseph Edward, to Monsanto Company. N-(hydrocarbylthio) amides. 3,855,262, Cl. 260-453.00r.

Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joe; and Williams, Charles R., to Monsanto Company. Process for sizing textile materials. 3,854,990, Cl. 117-139.50a.

Corn, Adolph D.: *See*—
Spiegel, Ray W.; Wassilak, Chester W.; and Corn, Adolph D., 3,854,762.

Corn States Metal Fabricators, Inc.: *See*—
Carter, Russell W., 3,854,852.

Cornelius, Gail, to Wade, R. M., & Co. Apparatus for interconnecting a hydrant and a riser pipe. 3,854,759, Cl. 285-251.000.

Corning Glass Works: *See*—
Polata, Bohumil; Marley, James A., Jr.; and Kerr, John T., 3,855,007.
Rittler, Hermann L., 3,854,963.

Corns, Williams M. Adjustable support shelf. 3,854,427, Cl. 108-1.000.

Correll, Harold M.: *See*—
Harris, Douglas H.; and Correll, Harold M., 3,854,993.

Corrigan, John D. Safety lock. 3,854,764, Cl. 292-289.000.

Corson, Steve. Tackle box latch. 3,854,558, Cl. 190-58.00a.

Cortese, Francesco: *See*—
Cortese, Gaetano; and Cortese, Francesco, 3,854,202.

Cortese, Gaetano; and Cortese, Francesco. Wire cutter for electrical use. 3,854,202, Cl. 30-91.200.

Cosco, Robert J.: *See*—
Pappas, John A.; Cosco, Robert J.; and Kokinos, Charles C., 3,855,495.

Cosden Oil & Chemical Company: *See*—
Moss, James H., Jr.; Daniels, Calvin L.; and Forward, Cleve H., 3,855,331.

Costain, Winston; and Terry, Bernard William Hugh, to Imperial Chemical Industries Limited. Inhibition of corrosion. 3,854,959, Cl. 106-14.000.

Costanza, Sam T.: *See*—
Nandi, Arabinda K.; Costanza, Sam T.; and Wheatley, Charles E., III, 3,855,548.

Cotter, William W., Jr.: *See*—
Whitney, Paul V., Jr.; Bolen, Robert J.; and Cotter, William W., Jr., 3,854,898.

Couch, Robert O., to Ric-Wil, Incorporated. Conduit system. 3,854,756, Cl. 285-47.000.

Could Inc.: *See*—
Shaltz, Gregory P.; and van Loo, Carl G., 3,855,128.

Coulter Electronics, Inc.: *See*—
Blank, Fritz, 3,854,602.
Figueroa, David Richard; and Ginsberg, Guenter, 3,854,879.

Coutin, Pierre Fernand: *See*—
Hasquenoph, Jean Henri; and Coutin, Pierre Fernand, 3,854,680.
Hasquenoph, Jean Henri; and Coutin, Pierre Fernand, 3,854,681.

Cowardin, Robert L.; Matuck, George C.; McCray, Charles M.; Powell, Flavius M.; Pratt, Woodrow W.; Thomas, Delbert C., Jr.; and Thorne, William D., to International Business Machines Corporation. Arcuate printer. 3,854,563, Cl. 197-1.00r.

Cowley, Gerald: *See*—
Upatnieks, Guntars I.; and Cowley, Gerald, 3,854,900.

Cowley, Gerald, to ERCO Industries Limited. Separation of gaseous mixtures of chlorine dioxide and chlorine and recovery of aqueous solution of chlorine dioxide. 3,854,901, Cl. 55-51.000.

Cowley, John James. Pressure regulator. 3,854,495, Cl. 137-505.440.

Cowper, Glenn Sherwin, to Caterpillar Tractor Company. Handling rod assembly for investment casting mold. 3,854,832, Cl. 403-349.000.

Cox, Oscar Leon. Motorcycle boat. 3,854,436, Cl. 115-.50a.

Cox, Randal A. Boom supported material handling fork. 3,854,609, Cl. 214-147.00g.

Cracknell, John Roland; and Gorszek, Aleksander Jerzy, to British Petroleum Company, Limited, The. Graphite pellets. 3,855,117, Cl. 208-307.000.

Crafton, Paul A.: *See*—
Paull, Stephen; and Crafton, Paul A., 3,854,310.

Crane, Harold G.: *See*—
Hillemann, Robert E., 3,854,389.

Cranfield Institute of Technology: *See*—
Loxham, John, 3,854,823.

Crawford, Juan Hamilton, to Industrial Nucleonics Corporation. Measuring gauge with air bearing and resistant to tilt. 3,855,524, Cl. 324-34.0tk.

Creech, Barnard C.: *See*—
De Vries, Donald L.; and Creech, Barnard C., 3,855,014.

Cresswell, Ronald M.; Mentha, John W.; and Seaman, Russell L., to Burroughs, Wellcome Co. 5-Benzyl pyrimidines intermediates therefore, and method. 3,855,265, Cl. 260-465.00e.

Crivello, James V., to General Electric Company. Polyimides. 3,855,239, Cl. 260-326.260.

Crocket, James H. Guide for severing sheet material. 3,854,214, Cl. 33-80.000.

Croisier, Alain, to International Business Machines Corporation. Method and apparatus for noise reduction in discrete phase modulated signals. 3,855,539, Cl. 329-104.000.

Cronin, John E., to United States of America, Army. Modulated transistor oscillators. 3,855,553, Cl. 331-117.00r.

Crosby Valve & Gage Company: *See*—
Zahorsky, John Richard, 3,854,494.

Crovetti, Aldo Joseph, to Abbott Laboratories. 4'-[(Diiodomethyl) sulfonyl] acetanilide. 3,855,253, Cl. 260-397.600.

Crowder, Wyly Kenneth. Pneumatic-electric transit systems. 3,854,410, Cl. 104-147.00r.

Csaky, Ernoe; and Thompson, C. Hugh, to Dow Chemical Company, The. Combination TOD-TC analysis method. 3,854,877, Cl. 23-230.0pc.

CTS Corporation: *See*—
Robinson, James H.; and Van Benthuysen, John D., 3,855,565.

Cunningham, Dortha. Medication server and guard. 3,854,478, Cl. 128-222.000.

Cusic, John W.; and Ellefson, Charles R., to Searle, G. D., & Co. 6-[Spiro-4'-(optionally substituted amino) cyclohexyl]-1,1a,6,10b-tetrahydrodibenzo[a,e] cyclopropa[c]cycloheptenes. 3,855,295, Cl. 260-570.5ca.

Cutler Hammer Inc.: *See*—
Hayward, William Herbert, 3,855,558.

Cutler, Hymie, to Bendix Corporation, The. Method and apparatus for performing a threading operation on a rotating workpiece. 3,854,353, Cl. 82-1.00c.

Cutler, Ivan B., to Universtiy of Utah. Production of silicon nitride from rice hulls. 3,855,395, Cl. 423-344.000.

Cutler, Royal A.: *See*—
Diana, Guy D.; and Cutler, Royal A., 3,855,297.

Cyclops Corporation: *See*—
Shingler, Thomas M., 3,854,550.

Cytryn, Ellis P. Cryogenic absorption cycles. 3,854,301, Cl. 62-101.000.

Czech, James I.; and Oakley, Roy C., Jr., to Whirlpool Corporation. Suspension mounting assembly for automatic washer. 3,854,308, Cl. 68-23.300.

Dahl, Henry A.: *See*—
Keur, Robert I.; and Dahl, Henry A., 3,854,399.

Dahlgren, John Victor Stanley. Sealing lock washer and method of manufacturing. 3,855,383, Cl. 264-230.000.

Dahneke, Barton E. Aerosol beam device and method. 3,854,321, Cl. 73-28.000.

Daicel Ltd.: *See*—
Sakakibara, Kozo; and Yasuda, Kiyoshi, 3,855,304.

Daikin Kogyo Kabushiki Kaisha: *See*—
Aiso, Hiroshi; Takemura, Takumi; and Takeuchi, Toshinobu, 3,855,401.

Daimler-Benz Aktiengesellschaft: *See*—
Stark, Karl; Achterwinter, Werner; and Brauer, Karl-Heinz, 3,854,247.

Dana Corporation: *See*—
Saidla, Glen W., 3,854,620.

Daniels, Calvin L.: *See*—
Moss, James H., Jr.; Daniels, Calvin L.; and Forward, Cleve H., 3,855,331.

Dann, Murray; Korshalla, Joseph Daniel; and Shu, Ping, to American Cyanamid Company. Method for the production and isolation of antibiotic AV290 sulfate. 3,855,410, Cl. 424-124.000.

D'Ascoli, Ralph G.: *See*—
Alleva, Leon L.; and D'Ascoli, Ralph G., 3,855,414.

Dataflux Corporation: *See*—
Chur, Sung Pal; and Brown, Leon H., Jr., 3,855,623.

Date, Masakazu; and Fukuoka, Shigeki, to Toyo Boseki Kabushiki Kaisha. Method and composition for imparting fire-proofness to synthetic shaped articles. 3,855,349, Cl. 260-849.000.

David, Walfried, to Bopp & Reuther GmbH. Sealing arrangement. 3,854,761, Cl. 285-336.000.

Davidson, James R., to Xerox Corporation. Development apparatus. 3,854,449, Cl. 118-637.000.

Davis, Richard K.; and Gareis, Ronald E., to General Electric Company. Transponder having high character capacity. 3,855,592, Cl. 343-6.8lc.

Dawidowicz, Jan; and Ferraro, Frank A., to Warner-Lambert Company. System for dispensing razor blade cartridges. 3,854,201, Cl. 30-40.200.

Day, John Charles; and Tack, Carl Edward, to AMSTED Industries Incorporated. Railway coupler. 3,854,599, Cl. 213-100.00r.

Dayus, Lloyd Giddis. Duct access door. 3,854,248, Cl. 49-504.000.

De Vries, Donald L.; and Creech, Barnard C., to Atlantic Richfield Company. Quenching oil composition and method of quenching metal. 3,855,014, Cl. 148-28.000.

Dean, Raymond Harkless: *See*—
Napoli, Louis Sebastian; and Dean, Raymond Harkless, 3,855,613.

Deardorff, Donald L.; Chesler, Edwin T.; and Fath, Joseph. Novel diacyl peroxides. 3,855,315, Cl. 260-610.00d.

Debat, Jacques, to Societe a Responsabilite Limitee dite: Institut de Recherches Chimiques ET Biologiques Appliquees, I.R.C.E.B.A. 2-4-Halobenzyl phenols and preparation thereof. 3,855,317, Cl. 260-619.00r.

DeCarneri, Ivo: *See*—
Melloni, Piero; Metelli, Raffailla; Vecchiette, Vittorio; DeCarneri, Ivo; and Gisella, Monti, 3,855,263.

DECCA Limited: *See*—
Botcherby, Stephen Charles Lauder, 3,855,594.

Decker, Edmund C., Jr.: *See*—
Boyle, Jamie N.; and Decker, Edmund C., Jr., 3,854,374.

Deconinck, Hugo Frans: *See*—
Stievenart, Emile Frans; Deconinck, Hugo Frans; and Muller, Jurgen, 3,854,446.

Deepsea Ventures, Inc.: *See*—
McCutchen, Hugh L.; and Cardwell, Paul H., 3,855,089.

Deere & Company: *See*—
Talak, John Frank; and Hobson, John Lester, 3,854,559.

Degen Felix, to Inpaver AG. Under mattress for reclining furniture. 3,854,154, Cl. 5-202.000.

Delmar Chemicals Limited: *See*—
Podesva, Ctirad; and Solomon, Carola, 3,855,294.

Demag Baumaschinen Gesellschaft mit beschrankter Haftung: *See*—
Kuhn, Eberhard, 3,854,595.

Demmeler, Martin, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. UV-spectrographic analysis of beryllium and carbon for determining nuclear reactor fuel element consumption. 3,855,475, Cl. 250-372.000.

DeMone, Archibald James. N-state logic circuit. 3,855,481, Cl. 307-225.00r.

Dempster, James W., to Carrier Corporation. Refuse compacting device. 3,854,397, Cl. 100-41.000.

Den Hollander, Charles William; Leimgruber, Willy; and Mohacsi, Ernest. (-)-Di-0-isopropylidene-2-keto-L-gulonates. 3,855,227, Cl. 260-286.00r.

Denker, James M., to Nutron Corporation. Engines. 3,854,284, Cl. 60-39.610.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Fukuda, Makoto; Nakano, Tatsuo; and Kishi, Ikuji, 3,855,166.

Denki Kogaku Kogyo Kabushiki Kaisha: *See*—
Takizawa, Hidehiko; and Hisashige, Mituto, 3,855,354.

Derosset, Armand J.; and Morgan, Kenneth A., to Universal Oil Products Company. Recovery of rhenium from a spent catalyst. 3,855,385, Cl. 423-49.000.

Derrick, Noah S.; and Zeigler, Jacob T., to General Electric Company. Stacked electrode capacitor and method of making same. 3,854,196, Cl. 29-570.000.

Deutsch, Ralph, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic arpeggio. 3,854,366, Cl. 184-1.240.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Klinger, Karl-Heinz, 3,855,221.

DeVaan, Robertus Laurentius Clemens: *See*—
Timmermans, Abraham; and DeVaan, Robertus Laurentius Clemens, 3,855,543.

Dexter, Richard J.: *See*—
Lloyd, William W.; and Dexter, Richard J., 3,855,009.

Diana, Guy D.; and Cutler, Royal A., to Sterling Drug Inc. 1,1'-Bridged-bis [N-(alkyl)-2-aminoethanols]. 3,855,297, Cl. 260-584.00r.

Dick, A. B., Company: *See*—
Keur, Robert I.; and Dahl, Henry A., 3,854,399.

Dickinson, Ben Wade Oakes, III; and Dickinson, Robert Wayne. Intravaginal device and method. 3,854,476, Cl. 128-138.000.

Dickinson, Robert Wayne: *See*—
Dickinson, Ben Wade Oakes, III; and Dickinson, Robert Wayne, 3,854,476.

Didycz, William J.; and Seabury, Almon D., to United States Steel Corporation. High service temperature pressure sensitive device. 3,854,522, Cl. 165-1.000.

Dieball, Kenneth C.: *See*—
Burgess, John E.; Dieball, Kenneth C.; and Obrycki, Raymond F., 3,855,473.

Diebert, Curtis E.: *See*—
Fisher, John G.; and Diebert, Curtis E., 3,855,215.

Diehl, Karl: *See*—
Bauer, Carl Otto; Bode, Ernst; Diehl, Karl; and Rauhaus, Gerd, 3,854,350.

Dietrich, Joseph R.; and Groves, Malcolm D., to Combustion Engineering, Inc. Bottom actuated reactor control rod devices. 3,855,060, Cl. 176-36.00r.

Dietz, Charles H.: *See*—
Frech, Roger A.; Dietz, Charles H.; and Hauerbach, Markvard, 3,854,817.

Dillard, Robert D., to Lilly, Eli, and Company. 2-Amino-2-allenylmalonic esters. 3,855,271, Cl. 260-468.00j.

Dimension Weld International Corporation, The: *See*—
Kuroda, Minoru, 3,855,043.

Dingman, Charles Wesley, II. Molecular models for nucleic acids. 3,854,223, Cl. 35-18.00a.

Discojet Corporation: *See*—
Moller, Paul S., 3,854,549.

Ditusa, Anthony J.: *See*—
Giori, Francis A.; and Ditusa, Anthony J., 3,854,472.

Diveley, William R., to Hercules Incorporated. Thiophosphorylating a saturated hydrocarbon group. 3,855,105, Cl. 204-162.00r.

Divine, David L.; and Vines, Darrell L. Electronically operated machine for teaching mathematics. 3,854,226, Cl. 35-31.00c.

Dobben, Glenn D., to Squibb, E. R., & Sons, Inc. Radiographic contrast composition containing 2',6'-diiodo-dl-thyronine and methods of use thereof. 3,855,405, Cl. 424-5.000.

Dobson Park Industries Limited: *See*—
Polland, Thomas, 3,854,776.

Dochterman, Richard W., to General Electric Company. System using motor driven control device. 3,854,916, Cl. 62-180.000.

Dodd, Joseph C. Mixer for algae ponds. 3,855,370, Cl. 261-92.000.

Doduco, Eugen Durrwachter, Dr.: *See*—
Bolz, Walter; Herzog, Horst; Herzog, Alfred; and Neese, Hans J., 3,855,108.

Doherty, Thomas E.: *See*—
Amberg, Stephen W.; and Doherty, Thomas E., 3,854,583.

Dohgane, Iwao: *See*—
Suda, Hideaki; Dohgane, Iwao; Hosaka, Hirokazu; and Ebara, Kazunari, 3,855,195.

Dohr, Manfred; Singer, Helmut; and Umbach, Wilfried, to Henkel & Cie GmbH. Process for the production of higher, polyunsaturated carboxylic acid ester and free acids. 3,855,255, Cl. 260-410.90r.

Dolan, John J.: *See*—
Erdmann, Manfred O.; and Dolan, John J., 3,855,027.

Dolby, John T., mesne: *See*—
Dolby, John Topping, 3,854,590.

Dolby, John Topping, to Dolby, John T., mesne and Bender, David M. Wine rack. 3,854,590, Cl. 211-74.000.

Dolfini, Joseph Edward; Bohme, Ekkehard; and Slusarchyk, William A., to Squibb, E. R., & Sons, Inc. 6-Substituted penicillanic acid and derivatives thereof. 3,855,233, Cl. 260-306.70c.

Dolukhanov, Rafik Tsaturovich: *See*—
Medem, Vulf Matveevich; Boldrev, Sergei Andreevich; Karpenko, Leonty Petrovich; Dolukhanov, Rafik Tsaturovich; and Sergeev, Nikolai Sergeevich, 3,855,116.

Domtar Limited: *See*—
Barnett, George J.; Stanoy, Mark; and Watson, Robert L., 3,854,838.

Donermeyer, Donald D.: *See*—
Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joe; and Williams, Charles R., 3,854,990.

Dong, Poy. Portable magnetic chuck. 3,854,711, Cl. 269-8.000.

Dorawala, Tansukhlal G.: *See*—
Estes, John H.; Kerr, Edwin R.; and Dorawala, Tansukhlal G., 3,855,335.

Dore, James E.; Sevier, Peter E.; and Yarwood, John C., to Swiss Aluminum Ltd. Purification of molten aluminum and alloys. 3,854,934, Cl. 75-68.00r.

Dorfel, Walter; and Gorner, Bernd, to Ahlstrom Development GmbH. Pressure-balanced wide web guide roller. 3,854,646, Cl. 226-191.000.

Dorr-Oliver Incorporated: *See*—
Probstmeyer, Helmuth, 3,854,658.

Dorsey, Denis Peter; and Rodda, William E., to RCA Corporation. Dual bias controlled storage tubes. 3,855,497, Cl. 315-30.000.

Doughty, Thomas Russel, Jr.; Sperati, Carleton Angelo; and Un, Howard Ho-Wei, to Du Pont de Nemours E. I., and Company. Polytetrafluoroethylene molding powders of tetrafluoroethylene and perfluoro (alkyl vinyl ether) copolymer. 3,855,191, Cl. 260-87.500.

Douglas, Bobby L., to Dresser Industries, Inc. Oil well pumpoff control system utilizing integration timer. 3,854,846, Cl. 417-12.000.

Dow Chemical (Nederland) B.V.: *See*—
van Eijl, A. Theodorus, 3,855,399.

Dow Chemical Company: *See*—
Sarnacke, Philip M.; and Archer, Wesley L., 3,854,958.

Dow Chemical Company, The: *See*—
Csaky, Ernoe; and Thompson, C. Hugh, 3,854,877.
Flynn, James P., 3,855,022.
George, Percy F., 3,855,050.
Gurley, Derrel G.; and Copeland, Claude T., 3,854,533.
Myers, Harold D.; and Moore, William G., 3,854,299.
Senkbeil, Herman O., 3,854,926.
Thill, Bruce P., 3,855,217.

Downs, Thomas P. Record divider and preservative. 3,854,729, Cl. 274-1.00r.

Doyle, Edward J.; Landis, Earle; and Saganowski, Mieczyslaw, to Schick Incorporated. Hair styling appliance. 3,854,489, Cl. 132-11.000.

Doyle, William C., Jr., to Gulf Research & Development Company. 1,3,4-Thiadiazine herbicides. 3,854,924, Cl. 71-90.000.

Drabek, Jozef; and Varsanyi, Denis, to Ciba-Geigy Corporation. Phosphoric acid phenylsulphonamide esters. 3,855,362, Cl. 260-944.000.

Dragoco Spezialfabrik Konz, Riech- und Aromastoffe Gerberding & Co. GmbH: *See*—
Klein, Erich, 3,855,407.

Dravo Corporation: *See*—
Selmeczi, Joseph G.; and Kestner, Daniel W., 3,855,391.

Dregger, Ernst Ullrich: *See*—
Pause, Kurt; Dregger, Ernst Ullrich; and Otten, Gottfried, 3,854,657.

Dressel, William George: *See*—
Germain, Andrew Gerald; Dressel, William George; and Sandor, Louis, 3,854,899.

Dresser Industries, Inc.: *See*—
Douglas, Bobby L., 3,854,846.
Martin, Paul Warren, 3,854,314.

Dreyfus, Marc G.: *See*—
Altman, Norman G.; and Dreyfus, Marc G., 3,854,822.

Driscoll, John J., to Polaroid Corporation. Photographic apparatus. 3,854,809, Cl. 354-86.000.

Du Molin, Henry J. Package and center-piece. 3,854,577, Cl. 206-45.330.

Du Pont de Nemours, E. I., and Company: *See*—
Breen Alvin L.; and Lauterbach, Herbert G., 3,854,177.
Bryan, Paul J.; and McConnell, Ronald F., 3,854,491.
Burke, Patrick Michael, 3,855,288.
Doughty, Thomas Russel, Jr.; Sperati, Carleton Angelo; and Un, Howard Ho-Wei, 3,855,191.
Eanzel, Albert Robert, 3,854,871.
Fuchs, Julius Jakob; and Lin, Kang, 3,855,219.
Held, Robert Paul, 3,854,950.
Iler, Ralph K.; and McQueston, Herbert J., 3,855,172.
Kegelman, Matthew Roland, 3,855,006.
Larry, John Robert, 3,854,957.
MacDonald, Robert Neal, 3,855,183.
Rudd, David William, 3,854,668.
Rushmere, John Derek, 3,855,085.
Schindel, Wesley Gerald, 3,855,151.
Smith, Frank T.; and Smith, Robert D., 3,854,523.
Vollkommer, Robert J., 3,855,260.

Dubeck, Michael; and Im, Suk Joong, to Ethyl Corporation. Process for winning copper using carbon monoxide. 3,855,384, Cl. 423-42.000.

Dubois, Claude; and Maurin, Jean, to Compagnie Francaise de Raffinage. Method of synthesizing isopentane hydroperoxide. 3,855,314, Cl. 260-610.00b.

Ducasse, Henri: *See*—
Sahores, Jean; and Ducasse, Henri, 3,855,470.

Ducon Company, The: *See*—
Kalen, Bodo, 3,854,902.

Dudley, Kenneth W.: *See*—
MacMaster, George H.; and Dudley, Kenneth W., 3,855,498.

Dudzic, Max S.: *See*—
Anderton, John J.; Dudzic, Max S.; and Wrhen, Wilmer C., 3,854,188.

Duffy, Edward T., to Manhattan Industries, Inc. Shirt collar construction. 3,854,147, Cl. 2-132.000.

Dugan, William P., to Sun Ventures, Inc. Open trough filler. 3,855,132, Cl. 210-455.000.

DuKane Corporation: *See*—
Fox, Robert C.; Altman, James S.; and King, Charles W., 3,855,415.

Duke, Robert T., to Fibre Formations, Inc. Device for administering an enema. 3,854,479, Cl. 128-227.000.

Duke, Roy B., Jr., to Marathon Oil Company. Oxydehydrogenation of organic nitriles. 3,855,268, Cl. 260-465.300.

Dull, Hans-Jurgen, to Siemens Aktiengesellschaft. Switch for use in a magnetic suspension railroad. 3,854,412, Cl. 104-148.0ms.

Dumas, Christ J., to American Plasticraft Company. Voltage divider assembly with thick film resistance elements. 3,855,564, Cl. 338-48.000.

Dunn, George L.; and Hoover, John R. E., to Smith Kline & French Laboratories. 3-Heterocyclic thiomethyl-cephalosporins. 3,855,213, Cl. 260-243.00c.

Dunning, Fred R. Football facemask. 3,854,146, Cl. 2-9.000.

Duplessy, Jean. Shuttleless loom grippers. 3,854,505, Cl. 139-122.000.

Durand, Jean-Pierre; Fabre, Claude; and Osgan, Maseh, to Gerdec. Polymerization of vinyl chloride monomer in the presence of siliceous fillers. 3,855,162, Cl. 260-17.4st.

Duret, Jean, to Societe Anonyme dite: Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies). Joint for oil well drilling pipe. 3,854,760, Cl. 285-334.000.

Durkee-Atwood Company: *See*—
Olson, Elmer I., 3,854,584.

Duroux, Jean. Method for the location, by surface waves, of a source of electromagnetic radiation and determination of the position of a place with respect to one or more sources. 3,855,596, Cl. 343-112.00d.

Dusza, John Paul; Lindsay, Harry Lee; and Bernstein, Seymour, to American Cyanamid Company. Phenanthryl ethylidene carbazic acid esters. 3,855,276, Cl. 260-471.00c.

Duttarer, Ralph M.: *See*—
Jesswein, Ronald M.; Hushower, Richard R.; and Duttarer, Ralph M., 3,854,542.

Duvall, Calvin David. Baseball game having variable batting means. 3,854,720, Cl. 273-89.000.

Duxbury, Frederick Keith: *See*—
Oldham, Joseph; and Duxbury, Frederick Keith, 3,855,350.

Duxbury, Jean: *See*—
Oldham, Joseph; and Duxbury, Frederick Keith, 3,855,350.

Dye, John A.; and Arnold, Joe F., to United Aircraft Corporation. Reflecting device construction. 3,854,800, Cl. 350-310.000.

Dynacycle Corporation: *See*—
Paynter, Henry M., 3,854,383.

Eanzel, Albert Robert, to Du Pont de Nemours E. I., and Company. Textile cleaning process for simultaneous dry cleaning and finishing with stain repellent. 3,854,871, Cl. 8-142.000.

Earl, David George: *See*—
Rankine, Robin Patrick; Earl, David George; and Mellor, Roger, 3,854,876.

Eason, E. Craig. Wiener cooker attachment unit for rotisseries. 3,854,392, Cl. 99-421.00h.

Eastman Kodak Company: *See*—
Allinger, Hubert B.; Gray, Glen G.; Indre, Robert S.; and Kelly, Robert J., 3,855,455.

Batesky, Donald C.; and Schultz, William C., 3,855,238.
Bush, Walter Monroe; and Reardon, Daniel Francis, 3,854,945.
Ettischer, Helmut; and Huschle, Peter, 3,854,810.
Fisher, John G.; and Diebert, Curtis E., 3,855,215.
Gilman, Paul Brewster, Jr.; Raleigh, Ronald George; and Merrigan, Joseph Andrew, 3,854,949.
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Ebasco Services Incorporated: *See—*
Summers, William A.; Christy, Betty L.; and Sweeney, Joseph V., 3,855,456.

Eckel, Oliver C. Door body. 3,854,263, Cl. 52-615.000.

Eckstein, George R.; and Moyher, William G., to Remington Arms Company, Inc. Method of making plastic cartridge casing. 3,855,381, Cl. 264-138.000.

Ederer Incorporated: *See—*
Mordre, Sigurd C., 3,854,592.

Edmunds, Frank L. Method and apparatus for indicating time in terms of color. 3,854,279, Cl. 58-50.00r.

Edwards, Edward M., to Owens-Illinois, Inc. Closure for bottles and jars. 3,854,617, Cl. 215-304.000.

Edwards, Ralph R. Tire chain carriers. 3,854,514, Cl. 152-233.000.

Ehbel, Jan Dirk: *See—*
Van Hijfte, Herman Michel; and Ehbel, Jan Dirk, 3,855,593.

Ehrreich, John E.; and Reti, Adrian R., to Graham Magnetics, Inc. Acicular cobalt powders having high squareness ratios. 3,855,016, Cl. 148-31.570.

Eidson, John C.: *See—*
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Eisen, Irving A.; and Maresca, Gerard. Validating system and method. 3,855,454, Cl. 235-92.0ct.

Elco Industries, Inc.: *See—*
Gutshall, Charles E., 3,854,372.

Electro Sciences for Medicine, Inc.: *See—*
Giori, Francis A.; and Topolski, Alvin S., 3,854,469.
Giori, Francis A.; and Ditusa, Anthony J., 3,854,472.

Electrolytic Zinc Company of Australasia Limited: *See—*
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Elektroschmelzwerk Kempten GmbH: *See—*
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Elgin Sweeper Company: *See—*
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Elkay Manufacturing Company: *See—*
Farrell, Gerald J., 3,854,493.

Ellefson, Charles R.: *See—*
Cusic, John W.; and Ellefson, Charles R., 3,855,295.

Ellis, George R., to Xerox Corporation. Photoelectric tabulating apparatus. 3,854,566, Cl. 197-176.000.

Ellis, Robert. Rectangular field with transverse ball hurdle. 3,854,721, Cl. 273-95.00h.

Elmore, Lester C.; and Broxholm, Thomas M., to Pulsepower Systems Inc. Liquid propellant weapon. 3,854,376, Cl. 89-33.00b.

Emhart Corporation: *See—*
Jones, Stanley Peter, 3,854,921.

Engelsberger, Herbert, to Feldmuhle Anlagen- und Produktionsgesellschaft, mit beschrankter Haftung. Vacuum tight plastic sheet envelope. 3,854,653, Cl. 229-51.00r.

Engelson, David. Apparatus for making beaded belts. 3,854,187, Cl. 29-208.00d.

Engles, Hans Michael. Load-bearing hook. 3,854,689, Cl. 248-340.000.

Enrini, Ferruccio: *See—*
Vettore, Bruno; Enrini, Ferruccio; and Percali, Tullio, 3,855,627.

Entreprise de Recherches et d'Activites Petrolieres Elf: *See—*
Knoche, Hubert, 3,855,340.

Environmental Sciences Associates, Inc.: *See—*
Matson, Wayne R., 3,855,099.

Erba, Carlo, S.p.A.: *See—*
Melloni, Piero; Metelli, Raffailla; Vecchiette, Vittorio; DeCarneri, Ivo; and Gisella, Monti, 3,855,263.

ERCO Industries Limited: *See—*
Cowley, Gerald, 3,854,901.
Upatnieks, Guntars J.; and Cowley, Gerald, 3,854,900.

Erdmann, Manfred O.; and Dolan, John J., to International Telephone and Telegraph Corporation. On-site fabrication of antennas. 3,855,027, Cl. 156-79.000.

Eskeli, Michael. Turbine. 3,854,841, Cl. 415-81.000.

Essex International, Inc.: *See—*
Pops, Horace; and Johnson, Barry C., 3,854,200.

Esso Research and Engineering Company: *See—*
Mosler, Henry A.; and Weber, Richard, 3,855,074.
Winkler, John C.; and Senyard, Corley P., 3,855,187.

Estes, John H.; Kerr, Edwin R.; and Dorawala, Tansukhlal G., to Texaco Inc. Method of steam dealkylation. 3,855,335, Cl. 260-672.00r.

Ethyl Corporation: *See—*
Dubeck, Michael; and Im, Suk Joong, 3,855,384.
Shapiro, Hymin; Giraitis, Albert P.; and Sanders, Robert N., 3,855,054.

Ethylene Corporation: *See—*
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Ettischer, Helmut; and Huschle, Peter, to Eastman Kodak Company. Synchronizing mechanism for flash and shutter actuation. 3,854,810, Cl. 354-142.000.

European Atomic Energy Community (Euratom): *See—*
Removille, Jacques Robert Philippe; and Schmit, Francois, 3,855,472.

Evans, James King. Liquid-vacuum generator for use with two chamber cleaning nozzle. 3,854,163, Cl. 15-321.000.

Evans Products Company: *See—*
Standridge, Robert E., 3,854,630.

Evesque, Roger A.: *See—*
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Exxon Production Research Company: *See—*
Maurer, Willam C.; and Lock, Everett H., 3,854,735.

Exxon Research and Engineering Company: *See—*
Mertzweiller, Joseph K.; and Tenney, Horace M., 3,855,324.
Mueller, Wolfgang H., 3,855,240.
Rossi, Albert, 3,854,893.
Whitney, Thomas A., 3,855,137.

Ezis, Andre; Goodyear, Michael U.; and Styhr, Karsten H., to Ford Motor Company. Method of making a bonded silicon nitride article having portions of different density. 3,854,189, Cl. 29-420.000.

F. LLI Marzoli & C. S.p.A.: *See—*
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Fabre, Claude: *See—*
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Fabrique Suisse de Crayons Caran d'Ache S.A.: *See—*
Girella, Albert, 3,854,825.

Fadler, Leonard L.; and Findley, C. Robert, to Leggett & Platt Incorporated. Sofa-sleeper. 3,854,153, Cl. 5-13.000.

Fairchild, Harold W., to Outboard Marine Corporation. Battery charger. 3,855,516, Cl. 320-22.000.

Fantl, Joe: *See—*
Corey, Albert E.; Donermeyer, Donald D.; Fantl, Joe; and Williams, Charles R., 3,854,990.

Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning: *See—*
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Ruschig, Heinrich; Schorr, Manfred; Muschaweck, Roman; and Rippel, Robert, 3,855,243.

Farmer, Robert B., to Katum Corporation. Film transfer device. 3,855,476, Cl. 250-470.000.

Farnam, F. D., Co.: *See—*
Farnam, Robert G., 3,854,736.

Farnam, Robert G., to Farnam, F. D., Co. Densified convolute gasket structure. 3,854,736, Cl. 277-204.000.

Farrar, Ralph C.; and Rothlisberger, Alvin C., to Phillips Petroleum Company. Polar compounds improve effectiveness of polyvinyl aromatic compounds. 3,855,189, Cl. 260-85.100.

Farrell, Gerald J., to Elkay Manufacturing Company. Valve cartridge. 3,854,493, Cl. 137-360.000.

Farrissey, William J., Jr.: *See—*
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Faust, Donald M.: *See—*
Hayes, Charles T.; Faust, Donald M.; and Weinert, Harry F., 3,854,606.

Fay, Gordon C., to Hendryx Engineers Incorporated. Kiln for ceramic products. 3,854,865, Cl. 432-137.000.

Feige, Norman G., Jr. Method of producing a coated anode. 3,855,084, Cl. 204-38.00r.

Feldman, Louis I., to Baxter Laboratories, Inc. Production of streptokinase. 3,855,065, Cl. 195-65.000.

Feldmuhle Anlagen- und Produktionsgesellschaft, mit beschrankter Haftung: *See—*
Engelsberger, Herbert, 3,854,653.

Felix, Ernst, to Zellweger, Ltd. Method and apparatus for determining the cross section of material using a sound field. 3,854,327, Cl. 73-69.000.

Fendel, Kurt: *See—*
Kurz, Kieter; Bauer, Johann; Balwe, Thomas; Fendel, Kurt; and Sabel, Alex, 3,855,190.

Ferezy, Edward: *See—*
Aelion, Rene; and Ferezy, Edward, 3,854,982.

Ferraro, Frank A.: *See—*
Dawidowicz, Jan; and Ferraro, Frank A., 3,854,201.

Ferrentino, Antonio, to Industrie Pirelli Societa per Azioni. Device with adjustable turn-shifting blades for laying or recovering submarine cables. 3,854,698, Cl. 254-190.00r.

Ferris, Daniel Ernest: *See—*

Groves, Malcolm Duane; Bevilacqua, Frank; and Ferris, Daniel Ernest, 3,855,059.

Fiberglas Canada Limited: *See*—
Rao, Ramesh P., 3,855,393.

Fibre Formations, Inc.: *See*—
Duke, Robert T., 3,854,479.

Fielibert, Jozef Frans; and van Rooijen, Adrianus, to Lever Brothers Company. Method of testing the seals of food containers and containers suitable therefor. 3,855,531, Cl. 324-65.00r.

Fieni, Walter, to Societe Anonyme Francaise du Ferodo. Safety belt. 3,854,749, Cl. 280-150.0sb.

Figueroa, David Richard; and Ginsberg, Guenter, to Coulter Electronics, Inc. Sample identification and test data correlation method and apparatus. 3,854,879, Cl. 23-230.00r.

Filfast Corporation: *See*—
Bauer, William H., 3,855,161.

Fillmore, Richard Plumb: *See*—
Huener, Robert Charles; and Fillmore, Richard Plumb, 3,855,549.

Findley, C. Robert: *See*—
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Firestone Tire & Rubber Company, The: *See*—
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Fischer, Adolf: *See*—
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Fischer, Allen Herbert, to International Telephone and Telegraph Corporation. Electrical interconnect device. 3,855,570, Cl. 339-267.000.

Fischer, Dragica: *See*—
Buchner, Stanislaus; and Fischer, Dragica, 3,855,201.

Fischer, Francis Elmer: *See*—
Prasad, Raj Nandan; and Fischer, Francis Elmer, 3,855,205.

Fischer, Hanspeter, to Ciba-Geigy Corporation. Pyridylium-s-triazines. 3,855,220, Cl. 260-248.0cs.

Fischer, Stefan; Galden, Peter; Scharrenbroich, Helmut; and Wollschlager, Dieter, to Zinpro Corporation. Mold opening and closing device for an apparatus making hollow bodies from thermoplastic material. 3,854,857, Cl. 425-214.000.

Fischer, Walter; and Rutkowski, Herbert, to U.S. Philips Corporation. Recording and/or playback apparatus. 3,854,676, Cl. 242-191.000.

Fish, Norman B. Monsoki. 3,854,738, Cl. 280-11.0bw.

Fisher, Evan D., to United States of America, Army. Thermal ignition device. 3,854,401, Cl. 102-70.00r.

Fisher, John G.; and Diebert, Curtis E., to Eastman Kodak Company. Methine compounds. 3,855,215, Cl. 260-243.00a.

Fitton, Peter; and Whitesides, Thomas, to Hoffmann-La Roche Inc. Preparation of 6-methyl-1,5-heptadiene. 3,855,338, Cl. 260-680.00r.

Fitzgerald, John V.: *See*—
Weiant, David S.; Velivis, William R.; and Fitzgerald, John V., 3,854,267.

Fitzmayer, Louis H.: *See*—
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Fitzsimmons, John Edward: *See*—
Brockmiller, Charles Anthony; Lund, Robert E.; and Fitzsimmons, John Edward, 3,855,387.

Flaceliere, Bernard Henri Gabriel; and Talvard, Jean-Pierre, to Logabax S.A. Printing heads for printing machines. 3,854,564, Cl. 197-1.00r.

Flasch, John Robert, to Stauffer Chemical Company. Preparation of high temperature shell molds. 3,854,961, Cl. 106-38.300.

Flasza, Michael D.; and Osuch, Leonard. Kiln heating control system. 3,855,452, Cl. 219-486.000.

Fleischer, Robert L., to General Electric Company. Detection and measurement of radiation damage by polarized light. 3,855,477, Cl. 250-473.000.

Fletcher, Kenneth S., III, to Foxboro Company, The. Ion-responsive electrode construction. 3,855,098, Cl. 204-195.00g.

Fletcher Sutcliffe Wild Limited: *See*—
Round, Charles, 3,854,295.

Fletcher, Wade D., to Sonoco Products Company. Deckle grinder. 3,854,249, Cl. 51-75.000.

Flint, Walker H.; and Haedicke, Gerald R., to Caterpillar Tractor Company. Vehicle step mounting arrangement. 3,854,752, Cl. 280-166.000.

Flower, Thomas A.: *See*—
Manning, Don P.; and Flower, Thomas A., 3,855,453.

Flucke, Winfried: *See*—
Wollweber, Hartmund; and Flucke, Winfried, 3,855,292.

Flynn, Errol W.; and Mutschler, Gene E. Collapsible ice shelter and sled. 3,854,746, Cl. 280-12.00s.

Flynn, James P., to Dow Chemical Company, The. Particulate aluminum hydride with nitrocellulose coating suitable for use in solid propellants. 3,855,022, Cl. 149-8.000.

FMC Corporation: *See*—
Hirahara, Katsuji, 3,854,395.

Foell, Theodore J.; and Yardley, John P., to American Home Products Corporation. P-glu-D-phe-Trp-Ser-Tyr-D-Ala-Leu-Arg-Pro-Gyl-NH_2- and intermediates. 3,855,199, Cl. 260-112.500.

Folkestad, Finn Enok; Loiten, Kjell Olav; Mejdell, Glor Thorvald; and Torvund, Asbjorn, to Norsk Hydro a.s. Method of removing boric acid and boric acid salts from aqueous magnesium chloride solutions. 3,855,392, Cl. 423-283.000.

Follows, Alan G.: *See*—
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Hoffman, Robert J.; and Follows, Alan G., 3,855,398.

Folzenlogen, Paul D.: *See*—
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Foral, Adolph J., Jr.; and Batdorf, Phillip N., to Black, Sivalls & Bryson, Inc. Method of removing and recovering aromatic hydrocarbons and water from a gas stream. 3,855,337, Cl. 260-674.00r.

Ford Motor Company: *See*—
Ezis, Andre; Goodyear, Michael U.; and Styhr, Karsten H., 3,854,189.
Woodward, Gary F., 3,855,532.

Fordemwalt, James N.: *See*—
Huber, Robert J.; Fordemwalt, James N.; and Smith, Kent F., 3,855,008.

Forster, Herbert, to Bosch, Robert, G.m.b.H. Process for manufacturing electrical condensers. 3,854,182, Cl. 29-25.420.

Fortune, William S. Pneumatically-controlled lathe system. 3,854,352, Cl. 82-21.00a.

Forward, Cleve H.: *See*—
Moss, James H., Jr.; Daniels, Calvin L.; and Forward, Cleve H., 3,855,331.

Forward, Robert L.: *See*—
Bell, Curtis C.; and Forward, Robert L., 3,854,340.

Fory, Werner: *See*—
Baccini, Peter; and Fory, Werner, 3,855,286.

Foseco International Limited: *See*—
Snow, George, 3,854,935.

Foster, Gene B., to Boeing Company, The. Multiplanar sensor and control system for use in roll forming machines. 3,854,215, Cl. 3-174.001.

Fowler, Joe W. Transilluminated pyramidal-shaped superstructure. 3,855,463, Cl. 240-9.00a.

Fox, Daniel W., to General Electric Company. Flame retardant compounds and thermoplastic compositions containing the same. 3,855,277, Cl. 260-45.70r.

Fox, James D.; Norman, Earl P., Jr.; and Sansbury, Jerry F., to Sonoco Products Company. Method of manufacturing container end with protective bead. 3,855,026, Cl. 156-69.000.

Fox, Robert C.; Altman, James S.; and King, Charles W., to DuKane Corporation. Communication sound system continuously monitored. 3,855,415, Cl. 179-1.0mn.

Foxboro Company, The: *See*—
Fletcher, Kenneth S., III, 3,855,098.

Fraioli, Joseph, Sr. Conveyor belt system. 3,854,575, Cl. 198-182.000.

Francotyp GmbH: *See*—
Kunisch, Alfred, 3,855,041.

Frank, Anton. Method for producing a pile support arrangement. 3,854,294, Cl. 61-51.000.

Franke, Edward L., Jr.; and Hyde, William J., to Western Electric Company, Incorporated. Apparatus for manufacturing waterproof cable. 3,854,444, Cl. 118-50.000.

Franklin, Mark E.; and Schmidt, James R. Impression syringe. 3,854,209, Cl. 32-60.000.

Franklin, Mark E.; and Schmidt, James R. Matrix and retainer therefor. 3,854,210, Cl. 32-63.000.

Franklin, William E.; and Rowland, Stanley P., to United States of America, Agriculture. Recurable crosslinked cellulose fabrics from methylol reagents and polycarboxylic acids and method of making. 3,854,866, Cl. 8-116.00r.

Franz, Dietmar; and Schmitt, Wilhelm, to Freudenberg, Carl, Kommanditgesellschaft. Sealing arrangement. 3,854,732, Cl. 277-58.000.

Franz, William F.: *See*—
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Fraser, George H.: *See*—
Halasz, Andrew; Childs, John D.; and Fraser, George H., 3,855,506.

Frech, Roger A.; Dietz, Charles H.; and Hauerbach, Markvard. Apparatus for continuous contact duplication. 3,854,817, Cl. 355-84.000.

Free-Flow Packaging Corporation: *See*—
Fuss, Gunter G., 3,855,053.

Frei, Ernst, to Pieren, Hermann, AG. Shell for apparatuses working in sound-absorbing, heat insulating or airtight conditions. 3,854,261, Cl. 52-404.000.

Freier, Gerald W., Sr., to Neenah Foundry Company. Load carrier with dual pin suspension. 3,854,573, Cl. 198-177.00r.

Freudenberg, Carl, Kommanditgesellschaft: *See*—
Franz, Dietmar; and Schmitt, Wilhelm, 3,854,732.

Fried, John H., to Syntex Corporation. Production of unsaturated carbocyclic ketones. 3,855,247, Cl. 260-340.900.

Friedrich, Gerhard; Heck, Gunter; and Schmidt, Adolf, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. Separation of mixtures of vinyl acetate and methanol containing minor amounts of methyl acetate and acetaldehyde by extractive

dstillation with an aromatic hydrocarbon. 3,855,078, Cl. 203-37.000.
Frietzsche, Gunter; and Krause, Peter, to Gillet, Paul, GmbH. Device for the purification of waste gases of internal combustion engines. 3,854,888, Cl. 23-288.00f.
Fromm, Bernard W.; Silvestri, Achille; and Jones, Arthur R., Jr., to United States of America, Army. Toxic agent leak detector. 3,854,885, Cl. 23-254.00r.
Frommer, Werner; Puls, Walter; and Schmidt, Delf, to Bayer Aktiengesellschaft. Process for the production of an amylase inhibitor. 3,855,066, Cl. 195-80.00r.
Fronczak, Ernest T.: *See—*
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Frost, Jack G.; Knox, John A.; and Martin, Larry D., to Halliburton Company. Method for removing magnetite scale. 3,854,996, Cl. 134-2.000.
Fuchs, Julius Jakob; and Lin, Kang, to Du Pont de Nemours, E. I., and Company. 1,3,5-Triazinediones. 3,855,219, Cl. 260-248.0ns.
Fuchslocher, Karl-Dieter: *See—*
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Fuji Photo Film Co., Ltd.: *See—*
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Fuji Photo Film Company, Ltd.: *See—*
Shiba, Keisuke; Amano, Hiroyuki; Ueda, Hirozo; and Sato, Akira, 3,854,953.
Fuji Photo Optical Co., Ltd.: *See—*
Tobioka, Takashi, 3,854,805.
Fuji Shashin Film Kabushiki: *See—*
Fujimura, Ikuo, 3,854,816.
Fuji, Takashi; and Otsuka, Yasuhide, to Nippon Kokan Kabushiki Kaisha. Magnetic metal defect-detecting apparatus. 3,855,530, Cl. 324-37.000.
Fujii, Tatsuji: *See—*
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Fujikura Cable Works Limited, The: *See—*
Yamaguchi, Tetsuo; Takayama, Teruyuki; and Hiderita, Masao, 3,854,193.
Fujimura, Ikuo, to Fuji Shashin Film Kabushiki. Photographic printing apparatus. 3,854,816, Cl. 355-71.000.
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Fujitsu Limited: *See—*
Honda, Masanori, 3,854,795.
Kohda, Yasuhiko, 3,854,713.
Niwa, Koichi; Anzai, Yoshiharu; Hashimoto, Kaoru; and Yokoyama, Hiromi, 3,854,965.
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Fukuda, Makoto; Nakano, Tatsuo; and Kishi, Ikuji, to Canon Kabushiki Kaisha and Denki Kagaku Kogyo Kabushiki Kaisha. Binder resins for electron photography and the like and method of production thereof. 3,855,166, Cl. 260-28.50r.
Fukumoto, Riyouichi; Fukura, Kenichi; and Nyunoya, Mizuo, to Aisin Seiki Kabushiki Kaisha and Aisin Seiki Company, Ltd. Vehicle door hinge. 3,854,167, Cl. 16-184.000.
Fukuoka, Shigeki: *See—*
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Fukura, Kenichi: *See—*
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Fukushima, Osamu: *See—*
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Fukushima, Osamu, to Fuji Photo Film Co., Ltd. Electrophotographic developing method and apparatus. 3,854,977, Cl. 117-37.0le.
Fullenkamp, Eugene Henry, to Hill Rom Company, Inc. Overbed table. 3,854,428, Cl. 108-146.000.
Fuller, Fred H. Method and apparatus for phonation analysis leading to valid truth/lie decisions by fundamental speech-energy weighted vibratto component assessment. 3,855,416, Cl. 179-1.0sa.
Fuller, Fred H. Method and apparatus for phonation analysis leading to valid truth/lie decisions by spectral energy region comparison. 3,855,417, Cl. 179-1.0sa.
Fuller, Fred H. Method and apparatus for phonation analysis leading to valid truth/lie decisions by vibratto component assessment. 3,855,418, Cl. 179-1.0sa.
Furukawa, Kazuo; Kato, Yoshio; Ohno, Hideo; and Katsuta, Hiroji, to Japan Atomic Energy Research Institute. Method of purifying sodium metal. 3,854,933, Cl. 75-66.000.
Fuss, Gunter G., to Free-Flow Packaging Corporation. Packing material. 3,855,053, Cl. 161-168.000.
GAF Corporation: *See—*
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Vandeputte, Camille Angelina; Huybrechts, Roger Joseph; Gallois, Daniel Jean; and Verbrugghe, Roland Gaston, 3,854,944.
Garbo, Paul W. Oxygenation of waste water. 3,855,120, Cl. 210-3.000.
Gardella, Arthur J.: *See—*
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Garnett, Donald P., to Allis-Chalmers Corporation. Means for protecting the rod of a hydraulic lift jack from damage by the lift chain. 3,854,699, Cl. 254-4.00c.
Garnett, Lawrence Taylor, to International Telephone and Telegraph Corporation. Flowmeter. 3,854,335, Cl. 73-233.000.
Garnier, Michael F.; Tang, Tung-Men; and White, James W., to International Business Machines Corporation. Magnetic head slider assembly. 3,855,625, Cl. 360-103.000.
Garrison, Clarence A.: *See—*
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Gates Rubber Company, The: *See—*
Lefevre, James F., 3,854,375.
Gatos, George C., to ICI America, Inc. Process of making hexahydro-1H-furo(3,4-c) pyrrole. 3,855,237, Cl. 260-326.008.
Gaudy, Oliver M. Transferable cargo container. 3,854,619, Cl. 220-1.500.
Gaw, Mary F.: *See—*
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Gaw, Richard Gerard, 1/2 to Gaw, Mary F. Containment of dust and fumes from a metallurgical vessel. 3,854,709, Cl. 266-16.000.
Gay, Walter A.; and Raymond, Maurice A., to Olin Corporation. Method for preparing aromatic aldehydes. 3,855,305, Cl. 260-600.000.
Gazale, Midhat Joseph. Image recording and projection method and apparatus. 3,854,802, Cl. 352-40.000.
Gealt, Arthur E., to Honeywell Inc. Fluid tight seal and method of making same. 3,854,731, Cl. 277-26.000.
Gebr. Hofmann KG: *See—*
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Gee, Thomas A., to Eaton Corporation. Anti-skid system having improved sensor. 3,854,556, Cl. 188-181.00r.
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Herrmann, Walter; Geisler, Heinrich; and Hofer, Friedrich-Wilhelm, 3,854,289.
Genchi, Rocco. Tool holder. 3,854,639, Cl. 224-26.00b.
Gendron-Diemer, Inc.: *See—*
Limpach, Paul D., 3,854,774.
General Binding Corporation: *See—*
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General Concrete of Canada Limited: *See—*
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General Electric Company: *See—*
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General Signal Corporation: *See—*
Sievenpiper, Donald A., 3,854,499.
Genuit, Luther L., to Honeywell Information Systems Inc. Switching regulator using gate-turn-off SCR. 3,855,518, Cl. 321-2.000.
George, Percy F., to Dow Chemical Company, The. Metal structures which are self-destructible by chemical corrosion. 3,855,050, Cl. 161-165.000.
George, William Lloyd; Hays, Robert Guy; and Rhee, Chonokook John, to Motorola Inc. Vertical channel junction field-effect transistors and method of manufacture. 3,855,608, Cl. 357-22.000.
Georgia Kaolin Company: *See—*
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Geres, Robert J., to United States of America, Navy. Rotary valve jet flap control system. 3,854,678, Cl. 244-3.160.
Gerhold, Clarence G., to Universal Oil Products Company. Water vapor removal from vent gas systems. 3,854,300, Cl. 62-88.000.
Germain, Andrew Gerald; Dressel, William George; and Sandor, Louis, to AMSTED Industries Incorporated. Automatic mold cleaning. 3,854,899, Cl. 51-319.000.
Germain, Michel: *See—*
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Germer, Horst, to Triumph Werke Nurnberg Aktiengesellschaft. Method and device for producing prints and the like. 3,854,808, Cl. 354-5.000.
Germscheid, Hans Gunther, to Henkel & Cie GmbH. Process for the manufacture of phosphonic acids and phosphonates having at least two phosphorus atoms. 3,855,284, Cl. 260-502.40a.
Gertsch AG: *See—*
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Gertsch, Ernst; and Gertsch, Ulrich, to Gertsch AG. Releasa' ie ski binding partially mounted in a ski boot sole. 3,854,740, Cl. 280-1.350.
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Braun, William V.; Bruckert, Eugene J.; Giacomino, Gerald L.; and Partipilo, Phillip, 3,855,576.
Gibbs, Dudley Francis; Bennet, Edward John; and Hopkinson, William Ian, to Vickers Limited. Method of and apparatus for promoting a reaction between a liquid specimen and a liquid reagent. 3,854,703, Cl. 259-11.000.
Gilbert, Alfred R.: *See—*
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Switzer, George; and Bolez, Carl A., 3,854,896.
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Gillette Company, The: *See—*
Webster, Milo E., 3,854,862.
Gilliam, Howard E., Sr., to Chemprene, Inc. Combination rotary and reciprocating unitary sealing mechanism. 3,854,737, Cl. 277-205.000.
Gilman, Paul Brewster, Jr.; Raleigh, Ronald George; and Merrigan, Joseph Andrew, to Eastman Kodak Company. Silver halide photographic compositions and processes for obtaining positive images. 3,854,949, Cl. 96-76.00r.
Ginn, Martin E.: *See—*
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Ginners Incorporated: *See—*
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Giori, Francis A.; and Topolski, Alvin S., to Electro Sciences for Medicine, Inc. Epiurethral valve. 3,854,469, Cl. 128-1.00r.
Giori, Francis A.; and Ditusa, Anthony J., to Electro Sciences for Medicine, Inc. Pulse comparator. 3,854,472, Cl. 128-2.06a.
Giraitis, Albert P.: *See—*
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Girard, Pierre: *See—*
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Giraudon, Raymond, to Rhone-Poulenc S.A. 1-Alkoxycarbonyl-2-alkylcarbamoylmethyl-3-(2-arylamido-phenyl) isothiourea. 3,855,272, Cl. 260-470.000.
Girella, Albert, to Fabrique Suisse de Crayons Caran d'Ache S.A. Refillable pencil. 3,854,825, Cl. 401-94.000.
Girling Limited: *See—*
Nicholls, Lawrence George, 3,854,710.
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Najer, Henry; and Giudicelli, Jean-Francois, 3,855,230.
GKN Sankey Ltd.: *See—*
Humphrey, Victor William Stanley, 3,854,691.
Gladstein, Alan. Support structure for a receptacle or the like. 3,854,242, Cl. 47-35.000.
Glory Impression Cartonnage: *See—*
Lechene, Bernard Louis, 3,854,259.
Glory Kogyo Kabushiki Kaisha: *See—*
Hatanaka, Yoshihiro; Shigemori, Hideto; and Kitagami, Hisashi, 3,854,490.
Hatanaka, Yoshihiro; Abe, Masahiro; Terada, Hiroshi; and Inoue, Shigejiro, 3,854,714.
Gluncic, Berislav; and Kovacevic, Krunoslav, to Pliva Pharmaceutical and Chemical Works. 2,4-Diamino-5-(3,4,5-trimethoxybenzyl)-6-arylsulfonylpyrimides. 3,855,222, Cl. 260-256.50r.
Gluskin, Richard S.; Barcaro, Eugene B.; Phillips, Edwin R.; Schonfeld, Arnold; and Van Reymersdal, Joseph, to Sperry Rand Corporation. Pneumatic no-contact document read/write station. 3,855,621, Cl. 360-182.000.
Godec, Maksimiljan: *See—*
Zawadzki, George Z.; and Godec, Maksimiljan, 3,854,763.
Goedecke, Heiko; Rolff, Klaus-Peter; and Richter, Freidrich, to Siemens Aktiengesellschaft. Electric compressed-gas circuit breaker. 3,855,437, Cl. 200-148.00r.
Goff, Richard E., Jr.: *See—*
Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Staffier, Thomas L., 3,854,978.
Goings, Harford E. Collapsible tube dispenser. 3,854,628, Cl. 222-103.000.
Golborn, Peter. Process for imparting flame resistance to textile material. 3,854,989, Cl. 117-136.000.
Goldsberry, Fred L., to Lone Star Gas Company. Constant density regulator. 3,854,663, Cl. 236-92.00c.
Golin, Jury Petrovich: *See—*
Kotova, Valentina Georgievna; Akopian, Gretel Artashesovna; Galitsky, Anatoly Ivanovich; Golin, Jury Petrovich; Snezhko, Valery Grigorievich; Kolesnichenko, Leonid Georgievich; Ivanenko, Larisa Akimovna; and Nekrasov, Jury Fedorovich, 3,855,446.
Gomi, Shimpei: *See—*
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Gonzales, Adrian, Jr. Self Contained pruning mechanism. 3,854,204, Cl. 30-228.000.
Goodacre, Cecil, to Lansing Bagnall Limited. Industrial pallet and stillage trucks. 3,854,748, Cl. 280-43.120.
Goodman, David S., to International Telephone and Telegraph Corporation. Electrical connector assembly. 3,854,788, Cl. 339-176.00m.
Goodman Equipment Corporation: *See—*
Kamner, Haim J., 3,854,607.
Goodrich, B. F., Company, The: *See—*
Son, Pyong-Nae, 3,855,261.
Goodyear, Michael U.: *See—*
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Watts, William A., 3,855,358.
Gordon, Harry W.; and Schaffner, Carl P., to Schmid Laboratories, Inc., mesne. Method for treating hypercholesterolemia. 3,855,409, Cl. 424-121.000.
Gordon, James O.; Cleevely, Bruce T.; and Niemi, William B., to Wheeling Stamping Co. Method for manufacturing unitary, seamless, collapsible thermoplastic tubes. 3,855,380, Cl. 264-97.000.
Gorling, Karl Goran, to Boliden Aktiebolag. Roasting, coarsening and hardening of iron sulfide materials. 3,854,931, Cl. 75-3.000.
Gorner, Bernd: *See—*
Dorfel, Walter; and Gorner, Bernd, 3,854,646.
Gorszek, Aleksander Jerzy: *See—*
Cracknell, John Roland; and Gorszek, Aleksander Jerzy, 3,855,117.
Goserud, Dean L. Fish bag holders. 3,854,236, Cl. 43-55.000.
Gottelt, Herbert R., to Alco Standard Corporation. Bottle boring tool. 3,854,839, Cl. 408-129.000.
Gottfried Bischoff Bau Kompl. Gasreinigungs -und Wasserruckkuhlanlagen Kommanditgesellschaft: *See—*
Hausberg, Gerhard; and Hegemann, Karl-Rudolf, 3,854,908.
Gottschalt, Paul, to Siemens Aktiengesellschaft. High frequency coil having an adjustable ferrite pot core. 3,855,561, Cl. 336-83.000.
Gough, Alfredo A. Biochemical process. 3,855,121, Cl. 210-11.000.
Gould, George D., to Chevron Research Company. Integrated process combining hydrofining and steam cracking. 3,855,113, Cl. 208-89.000.
Grace, Martin I., to Sperry Rand Corporation. Broad band high frequency diode amplifier. 3,855,542, Cl. 330-34.000.

Grace, W. R., & Co.: *See*—
Kehr, Clifton Leroy; and Marans, Nelson S., 3,854,535.
Triggiani, Leonard Vincent; Sanchez, Moises Gali; and Ashby, George Elliott, 3,855,061.
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Grace, W. R., & Company: *See*—
Guthrie, James L.; and Rendulic, Francis J., 3,855,093.
Sergeys, Francis J., 3,854,186.

Graham, Leonard P.: *See*—
Lania, Anthony R.; Chase, Edward L.; Chase, Francis M.; Graham, Leonard P.; and Murray, James E., 3,855,051.

Graham Magnetics, Inc.: *See*—
Ehrreich, John E.; and Reti, Adrian R., 3,855,016.

Granquist, William T., to NL Industries, Inc. Synthetic smectite compositions, their preparation and their use as thickeners in aqueous systems. 3,855,147, Cl. 252-317.000.

Grantham, Frederick W. Apparatus and method for continuous drying of laundry goods. 3,854,221, Cl. 34-10.000.

Gray, Glen G.: *See*—
Allinger, Hubert B.; Gray, Glen G.; Indre, Robert S.; and Kelly, Robert J., 3,855,455.

Green, Charles Donald: *See*—
Amundson, Lonald Lloyd; Beuch, Wallace Eric; Green, Charles Donald; and Harris, William John, 3,855,457.

Green Glen R.: *See*—
Knight, James T.; and Green Glen R., 3,854,393.

Green, Joseph; and Roth, Shirley H., to Cities Service Company. Intumescent composition. 3,855,134, Cl. 252-8.100.

Green, William S.; and Newman, John W., to Ashland Oil, Inc. Process for pretreating mixed hydrocarbon dealkylation stock. 3,855,114, Cl. 208-121.000.

Greene, Richard M., to MOS Technology, Inc. Semiconductor device and circuits. 3,855,581, Cl. 340-173.00r.

Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., to Hanover Research Corporation. Process and apparatus for recovering residual oil from solids dehydrated in an oil medium and grossly deoiled. 3,855,079, Cl. 203-47.000.

Gregorie, Keith E.; and Pfefferlen, Henry C., to United States of America, Atomic Energy Commission. Thermal switch-heat pipe. 3,854,524, Cl. 165-32.000.

Grenot, Michel; and Pergrale, Jean, to U.S. Philips Corporation. Method of using an optic relay comprising an element of an electro-optical material and a photosensitive element. 3,855,579, Cl. 340-173.01m.

Greytak, Donald A.; and Sargent, Duane S. Twine measuring trip mechanism for balers. 3,854,396, Cl. 100-8.000.

Griot, Rudolf G., to Sandoz-Wander, Inc. Cyclo-substituted-1-p-(ω-aminoalkoxy) phenyl cyclohexanes. 3,855,296, Cl. 260-570.700.

Grise, Frederick G. J.; and Lovell, Walter, to Pioneer Coveralls, Inc. Truck cover. 3,854,770, Cl. 296-98.000.

Groff, Gaylord L., to Minnesota Mining and Manufacturing Company. Sheet-like nonwoven web and flexible article of polyester and aromatic polyamide staple fibers. 3,855,047, Cl. 161-150.000.

Groos, Ekkehard; and Ragoss, Hans, to Hochtemperatur-Reaktorbau GmbH. Method and device for discriminating between and sorting fuel elements of nuclear reactors. 3,855,058, Cl. 176-19.00r.

Gross, Siegfried. Overload switch-off device for hydraulic lifting or adjusting mechanisms connected in tandem, in particular for hydraulic loading and unloading cranes. 3,854,593, Cl. 212-39.00r.

Groves, Malcolm D.: *See*—
Dietrich, Joseph R.; and Groves, Malcolm D., 3,855,060.

Groves, Malcolm Duane; Bevilacqua, Frank; and Ferris, Daniel Ernest. Hydraulic system for nuclear reactors with hydraulically driven control rods. 3,855,059, Cl. 176-36.00r.

Grunert, Gerhard; and Hartmann, Erwin, to Siemens Aktiengesellschaft. Shorting device for generator output lines. 3,855,434, Cl. 200-144.00b.

Grunwald, John J.: *See*—
Mersereau, Mark; Rhodenizer, Harold L.; Grunwald, John J.; and Innes, William P., 3,854,973.

Gryctko, Carl E., to I-T-E Imperial Corporation. Test trip means for circuit breaker. 3,855,557, Cl. 335-42.000.

GTE Automatic Electric (Canada) Ltd.: *See*—
Lighthall, John T.; and Toy, Harry A., 3,855,580.

GTE Sylvania Inc.: *See*—
Pappas, John A.; Cosco, Robert J.; and Kokinos, Charles C., 3,855,495.

Guardian Electric Manufacturing Company: *See*—
Birtton, Leon R.; Vojir, Frank S.; and Wright, William W., 3,855,488.

Gudmundsen, Richard A., to Rockwell International Corporation. Conductor-insulator-junction (CIJ) optical memory device and a memory system dependent thereon. 3,855,583, Cl. 340-173.0ls.

Gueorguiev, Yordan Krestev: *See*—
Leyarovski, Evgueni Iliev; Nicolov, Borislav Vassilev; and Gueorguiev, Yordan Krestev, 3,854,913.
Leyarovski, Evgueni Iliev; Nicolov, Borislav Vassilev; and Gueorguiev, Yordan Krestev, 3,854,914.

Guerinet, Georges Rene: *See*—
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Gulf Research & Development Company: *See*—
Doyle, William C., Jr., 3,854,924.

Gulton Industries, Inc.: *See*—
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Gurley, Derrel G.; and Copeland, Claude T., to Dow Chemical Company, The. Method for forming a consolidated gravel pack in a subterranean formation. 3,854,533, Cl. 166-276.000.

Guthrie, James L.; and Rendulic, Francis J., to Grace, W. R., & Company. Radiation curable polyene-polythiol coating compositions. 3,855,093, Cl. 204-159.150.

Gutner, Kenneth H. Corner bracket for furniture case. 3,854,268, Cl. 52-753.00d.

Gutner, Kenneth H. Corner connector for tubular members. 3,854,831, Cl. 403-292.000.

Gutshall, Charles E., to Elco Industries, Inc. Screw adapted for visible inspection of tightness. 3,854,372, Cl. 85-61.000.

Gyorgy, Paul. Oil of tempeh. 3,855,256, Cl. 260-442.800.

Gyurusi, Bela: *See*—
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Haag, Franz: *See*—
Locher, Otto; Haag, Franz; and Bongartz, Paul, 3,855,148.

Haag, John Henry, to Kent Plastics Corporation. Apparatus for forming plastic articles from sheet materials. 3,854,860, Cl. 425-502.000.

Haas, Werner E. L.; and Adams, James E., to Xerox Corporation. Method for rapidly switching a display by sequential application of orthogonal electric fields to a liquid crystal material having optical properties of the nematic mesophase. 3,854,751, Cl. 35-160.0lc.

Haddad, Ihsan A., to Instrumentation Laboratory, Inc. Electrochemical electrode structure. 3,855,100, Cl. 204-195.00f.

Haedicke, Gerald R.: *See*—
Flint, Walker H.; and Haedicke, Gerald R., 3,854,752.

Hagener, James L.: *See*—
Church, Herman S.; Hagener, James L.; and Scifres, Zach M., III, 3,854,765.

Hahn, Carl, Dr., K.C.: *See*—
Messing, Bernd, 3,854,481.

Haighton, Adolf Johan; and Kattenberg, Hans Robert, to Lever Brothers Company. Interesterification process. 3,855,254, Cl. 260-410.700.

Hakata, Masayuki, to Casio Computer Co., Ltd. Apparatus for converting data into the same units. 3,855,459, Cl. 235-154.000.

Halasz, Andrew; Childs, John D.; and Fraser, George H., to Unican Security Systems, Ltd. Solid electrolyte coulometer. 3,855,506, Cl. 317-230.000.

Halcomb, Jack N.; d/b/a Audio Intelligence Devices: *See*—
Holcomb, Jack N.; and Sylten, Hans D. (said Sylten assor. to said), 3,855,534.

Halcon International, Inc.: *See*—
Winnick, Charles N.; and Posner, Judd, 3,855,275.

Hale, Thomas E., to General Electric Company. Coated cemented carbide products. 3,854,991, Cl. 117-169.00r.

Haley, James C., to Arizona Glass and Mirror Co., Inc. Panel door assembly. 3,854,165, Cl. 16-96.00r.

Hall, Arnold M., to Hovermarine Corporation. Air cushion vehicle. 3,854,547, Cl. 180-117.000.

Hallas, Robert; Tadanier, John Soloman; and Von Esch, Anne Mary, to Abbott Laboratories. 4"-O-Sulfonyl erythromycin-9-0-oxime derivatives. 3,855,203, Cl. 260-210.00e.

Halliburton Company: *See*—
Frost, Jack G.; Knox, John A.; and Martin, Larry D., 3,854,996.
Stephenson, Jack G.; and Mosier, John E., 3,854,596.

Hallock, Robert L., Jr. Adapter for fluid operated driving tool. 3,854,536, Cl. 173-15.000.

Hallowell, Fulton W.: *See*—
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Halpern, Alfred: *See*—
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Hamey, Peter Michael: *See*—
Walters, Ronald Bernard; and Hamey, Peter Michael, 3,854,382.

Hamma, Gerhard, to Mayer & Cie. Maschinenfabrik. Multi-system circular knitting machine having a pattern device. 3,854,304, Cl. 66-50.00r.

Hammerquist, Peter A. Apparatus for removing particles from an airstream. 3,854,910, Cl. 55-287.000.

Hanagata, Takayoshi; and Yamada, Suminobu, to Canon Kabushiki Kaisha. Recording apparatus. 3,855,448, Cl. 219-216.000.

Hanaue, Shigeru, to Sony Corporation. Cushion. 3,854,650, Cl. 229-14.00c.

Hancock, John Philip, to British Aluminium Company Limited, The. Connecting means. 3,854,269, Cl. 52-754.000.

Hancox, Alex J.: *See*—
Terrel, Gordon R.; Hause, Robert T.; Hancox, Alex J.; and McCulley, Fredrick J., 3,854,912.

Hannes, Karl, to Coats & Clark, Inc. Cast hinge. 3,854,166, Cl. 16-171.000.

Hannes, Karl, to Coats & Clark, Inc. Self-contained metal die casting dies. 3,854,521, Cl. 164-347.000.

Hanover Research Corporation: *See*—
Greenfield, Charles; Casparian, Robert E.; and Bonanno, Anthony J., 3,855,079.

Hansen, Hans Walter. Ski boot attachment frame. 3,854,743, Cl. 280-11.35k.

Hansen, Howard C., to Clark Equipment Company. Light reference system for aiding operator positioning of load handling devices and the like. 3,854,820, Cl. 356-138.000.

Hansen, Paul Bernard; and Pennings, Leon Benjamin, to Kimberly-Clark Corporation. Pattern bonded continuous filament web. 3,855,046, Cl. 161-150.000.

Hanyu, Susumu, to Janome Sewing Machine Co., Ltd. Zipper foot for use with sewing machine. 3,854,433, Cl. 112-235.000.

Harada, Yoshitugu: *See—*
Nagasawa, Taro; Ono, Joji; Kudo, Tutomu; and Harada, Yoshitugu, 3,855,063.

Hardin, John M. Catfish bait. 3,854,234, Cl. 43-42.060.

Harken, Russel D.: *See—*
Lannert, Kent P.; and Harken, Russel D., 3,855,248.

Harms, William J.; and Loy, Fred W., to Gardner-Denver Company. Electrical connector and method for making an electrical circuit. 3,855,567, Cl. 339-61.00m.

Harmuth, Joseph T., to Indian Head Inc., mesne. Bottle spraying apparatus. 3,854,439, Cl. 118-4.000.

Harris, Douglas H.; and Correll, Harold M., to Monsanto Research Corporation. Microwave circulator. 3,854,993, Cl. 117-212.000.

Harris, Edward B.; and Braun, David B., to Union Carbide Corporation. Wire and cable insulation comprising vinyl chloride polymer and lactone graft copolymer. 3,855,357, Cl. 260-897.00c.

Harris, William John: *See—*
Amundson, Lonald Lloyd; Beuch, Wallace Eric; Green, Charles Donald; and Harris, William John, 3,855,457.

Harsdorf, Jobst V.; and Tschunt, Edgar, to Siemens Aktiengesellschaft. Ray diagnosis apparatus. 3,855,479, Cl. 250-369.000.

Hart, Robert J., to Commercial Resins Company. Powder dispenser. 3,854,634, Cl. 222-193.000.

Hartman, Donn Allan: *See—*
Cloud, Charles E.; and Hartman, Donn Allan, 3,854,270.

Hartmann, Clinton S., to Texas Instruments, Incorporated. Selectable frequency bandpass filter. 3,855,556, Cl. 333-72.000.

Hartmann, Erwin: *See—*
Grunert, Gerhard; and Hartmann, Erwin, 3,855,434.

Hashimoto, Kaoru: *See—*
Niwa, Koichi; Anzai, Yoshiharu; Hashimoto, Kaoru; and Yokoyama, Hiromi, 3,854,965.

Hasquenoph, Jean Henri; and Coutin, Pierre Fernand, to Alkan, R., & Cie. Device for steadying loads suspended from aircrafts. 3,854,680, Cl. 244-118.09r.

Hasquenoph, Jean Henri; and Coutin, Pierre Fernand, to Alkan, R., & Cie. Device for steadying loads suspended from aircrafts. 3,854,681, Cl. 244-118.00r.

Hasselbeck, Richard J.: *See—*
Stolle, Ralph J.; Hasselbeck, Richard J.; and Kaminski, Elton G., 3,854,445.

Hatanaka, Yoshihiro; Shigemori, Hideto; and Kitagami, Hisashi, to Glory Kogyo Kabushiki Kaisha. Automatic money dispensing machine. 3,854,490, Cl. 133-4.00a.

Hatanaka, Yoshihiro; Abe, Masahiro; Terada, Hiroshi; and Inoue, Shigejiro, to Glory Kogyo Kabushiki Kaisha. Sheet dispensing machine. 3,854,714, Cl. 271-12.000.

Hatsutani, Miyako: *See—*
Kondo, Kiyosi; Matsumoto, Masakatsu; and Hatsutani, Miyako, 3,855,246.

Hauer, Rudolf: *See—*
Binder, Wilhelm; Hauer, Rudolf; and Bausch, Edmund, 3,855,486.

Hauerbach, Markvard: *See—*
Frech, Roger A.; Dietz, Charles H.; and Hauerbach, Markvard, 3,854,817.

Hauni-Werke Korber & Co. KG: *See—*
Wahle, Gunter, 3,854,611.

Hausberg, Gerhard; and Hegemann, Karl-Rudolf, to Gottfried Bischoff Bau Kompl. Gasreinigungs -und Wasserruckkuhlanlagen Kommanditgesellschaft. Apparatus for discharging flue gases from blast furnaces and the like. 3,854,908, Cl. 55-210.000.

Hause, Robert T.: *See—*
Terrel, Gordon R.; Hause, Robert T.; Hancox, Alex J.; and McCulley, Fredrick J., 3,854,912.

Hautier, Claude, to Micmo S.A. Device for fixing a gear-changer on a frame of cycles. 3,854,753, Cl. 280-236.000.

Hawrylo, Frank Zygmunt: *See—*
Kressel, Henry; Lockwood, Harry Francis; and Hawrylo, Frank Zygmunt, 3,855,607.

Hayes, Charles T.; Faust, Donald M.; and Weinert, Harry F., to Cascade Corporation. Vehicle with material loader. 3,854,606, Cl. 214-77.00r.

Hays, Robert Guy: *See—*
George, William Lloyd; Hays, Robert Guy; and Rhee, Chonokook John, 3,855,608.

Hayward, William Herbert, to Cutler Hammer Inc. Electrical contact attachment. 3,855,558, Cl. 335-132.000.

HB2 Inc.: *See—*
Hoisington, Perry M.; and Boldridge, Austin G., Jr., 3,854,909.

Hearn, Daniel P.; and Perkins, Thomas K., to Atlantic Richfield Company. Method and apparatus for monitoring the sand concentration in a flowing well. 3,854,323, Cl. 73-61.00r.

Heathcote, Bernard Vincent: *See—*
Adams, Stewart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,855,244.
Adams, Stuart Sanders; Armitage, Bernard John; Bristow, Norman William; and Heathcote, Bernard Vincent, 3,855,406.

Heck, Gunter: *See—*
Friedrich, Gerhard; Heck, Gunter; and Schmidt, Adolf, 3,855,078.

Heck, Richard F., to Hercules Incorporated. Introduction of organic groups into ethylenically unsaturated aldehydes or ketones using a group VIII metal salt. 3,855,302, Cl. 260-590.000.

Hedge, John A., to Sun Research and Development Co. Isomerization and/or transalkylation and/or disproportionation of alkylnaphthalenes. 3,855,328, Cl. 260-668.00a.

Hedrick, Warren R., to Allied Thermal Corporation. Air duffusers. 3,854,386, Cl. 98-40.00d.

Hegemann, Karl-Rudolf: *See—*
Hausberg, Gerhard; and Hegemann, Karl-Rudolf, 3,854,908.

Heichlinger, Norbert; and Andiel, Karl, to Hoechst Aktiengesellschaft. Process for the manufacture of slub yarns. 3,854,313, Cl. 28-72.120.

Heimo Gerattbau Gesellschaft mit beschrankter Haftung: *See—*
Locher, Otto; Haag, Franz; and Bongartz, Paul, 3,855,148.

Heinze, Walter W.; and Schnitta, Edward, to Universal Oil Products Company. Reactor system for gravity-flowing catalyst particles. 3,854,887, Cl. 23-288.00g.

Heinzle, Otto. Means for forming circular roofs. 3,854,690, Cl. 249-19.000.

Heitland, Herbert; and Manderscheid, Peter, to Volkswagenwerk Aktiengesellschaft. Arrangement for exhaust gas cleaning. 3,854,288, Cl. 60-300.000.

Held, Robert Paul, to Du Pont de Nemours, E. I., and Company. Halation protection for multilayer imaging of photopolymers. 3,854,950, Cl. 96-82.000.

Hellerich, Joseph. Dynamic balancing device for a computer disc memory. 3,854,347, Cl. 74-573.000.

Helmschrott, Norbert; Kelch, Heinz; Schuh, Eduard; and Zimmermann, Hans, to Kienzle Apparate GmbH. Apparatus for recording operational conditions of a motor car. 3,855,599, Cl. 346-62.000.

Hemphill, Dean P.: *See—*
Broussard, Douglas E.; Hemphill, Dean P.; Kolb, Robert H.; and Macy, Robert H., 3,854,297.

Hendryx Engineers Incorporated: *See—*
Fay, Gordon C., 3,854,865.

Henegar, Hubert B., to Bendix Corporation, The. Control system for multiple tape readers in an N/C system. 3,854,660, Cl. 235-61.11r.

Henkel & Cie GmbH: *See—*
Dohr, Manfred; Singer, Helmut; and Umbach, Wilfried, 3,855,255.
Germscheid, Hans Gunther, 3,855,284.
Singer, Helmut, 3,855,278.

Hennessey, Russell J., to Hoerner Waldorf Corporation. Carrier for tumblers, goblets and the like. 3,854,580, Cl. 206-426.000.

Henrick, Clive A., to Zoecon Corporation. Aliphatic di-olefinic halides. 3,855,322, Cl. 260-654.00r.

Herbst, Richard; Meingast, Erwin; and Wuerl, Ernst, to Krauss Maffei Aktiengesellschaft. Injection molding machine with accessible ejector assembly. 3,854,856, Cl. 425-173.000.

Hercules Incorporated: *See—*
Diveley, William R., 3,855,105.
Heck, Richard F., 3,855,302.
Trimble, David C., 3,854,157.

Herger, Zoltan L.; Kavanagh, Thomas S.; Olmsted, Dennis R.; and Campbell, Ronald R., to Storage Technology Corporation. Tape drive unit with offset backplate. 3,854,674, Cl. 242-182.000.

Herkes, John W. Cleaning apparatus for machine harvested sugar cane. 3,854,585, Cl. 209-3.000.

Hermann, Hans, to Triumph Werke Nuernberg A.G. Key switch. 3,855,439, Cl. 200-159.00r.

Herrin, Carlos B., to Monarch Marking Systems, Inc. Scanning apparatus. 3,855,478, Cl. 250-566.000.

Herrmann, Walter; Geisler, Heinrich; and Hofer, Friedrich-Wilhelm, to Bosch, Robert, G.m.b.H. Hydraulic control apparatus for endgates of trucks or the like. 3,854,289, Cl. 60-423.000.

Hershberger, Doran D., to General Electric Company. Dynamoelectric machine having improved lint guard means. 3,855,489, Cl. 310-85.000.

Herter's Inc.: *See—*
Hofmeister, Russell, 3,854,467.

Herzl, Peter J., to Fischer & Porter Company. Signal recovery system for vortex type flowmeter. 3,854,334, Cl. 73-194.00b.

Herzog, Alfred: *See—*
Bolz, Walter; Herzog, Horst; Herzog, Alfred; and Neese, Hans J., 3,855,108.

Herzog, Horst: *See—*
Bolz, Walter; Herzog, Horst; Herzog, Alfred; and Neese, Hans J., 3,855,108.

Heseltine, Donald W.: *See—*
Lincoln, Lewis L.; and Heseltine, Donald W., 3,854,956.

Hess, Howard V.; Franz, William F.; and Cole, Edward L., to Texaco Inc. Formation reduction in pressure coking equipment. 3,855,069, Cl. 201-2.500.

Hesse, Jack E.: *See—*
Morrison, Robert S.; and Hesse, Jack E., 3,854,504.

Hetherington, Matthew James; and Atkinson, Peter, to British Steel Corporation. Rotary ultrasonic testing apparatus. 3,854,326, Cl. 73-67.80s.

Hewlett-Packard Company: *See—*
Stockwell, Richard Kent, 3,855,461.

Heymann, Jorge Augusto: *See—*
Taurozzi, Eduardo H., 3,854,457.

Heywood, Jack; and Heywood, Roger, to Meiners Optical Devices Limited. Knitting machines and like fabric-producing machines. 3,854,306, Cl. 66-86.00a.

Heywood, Roger: *See—*
Heywood, Jack; and Heywood, Roger, 3,854,306.

Hickey, Roy E., to Singer Company, The. Slide tray positioning mechanism for a rear-screen projector. 3,854,807, Cl. 353-78.000.

Hiderita, Masao: *See—*
Yamaguchi, Tetsuo; Takayama, Teruyuki; and Hiderita, Masao, 3,854,193.

Highberger, Grant H., to Republic Steel Corporation. Fluid-cooled panel for furnace hood. 3,854,708, Cl. 266-16.000.

Hildebrand, Donald L.; Prescott, Ernest F.; and Kirk, Donald G., to Elgin Sweeper Company. Street sweeper with a hydrostatic transmission. 3,854,160, Cl. 15-84.000.

Hill, Harvey J., to Roberts Consolidated Industries, Inc. Method of cutting flat sheets into strips. 3,854,512, Cl. 144-326.00r.

Hill, Lester M., to Beloit Corporation. Paper formation utilizing a large diameter suction roll. 3,855,057, Cl. 162-301.000.

Hill Rom Company, Inc.: *See—*
Fullenkamp, Eugene Henry, 3,854,428.

Hillemann, Robert E., 40% to Crane, Harold G. Apparatus for producing liquid coffee. 3,854,389, Cl. 99-295.000.

Himi, Hitoshi, to Kabushiki Kaisha. Solid insulated breaker of a small size. 3,855,435, Cl. 200-144.00b.

Himmelmann, Wolfgang; Von Konig, Anita; Moll, Franz; and Saleck, Wilhelm, to AGFA-Gevaert Aktiengesellschaft. Silver halide emulsion containing a stabilizing combination of an azaidene and a N,N-dialkyl-dithiocarbamic acid ester. 3,854,954, Cl. 96-109.000.

Hinata, Masanao: *See—*
Shiba, Keisuke; Hinata, Masanao; Sato, Akira; Ogawa, Akira; and Ikeda, Tadashi, 3,854,955.

Hinderer, Helmuth E.: *See—*
Bach, Hartwig C.; and Hinderer, Helmuth E., 3,855,321.

Hinnen, Hermann; and Borgeaud, Gaston, to Schweizerische Lokomotio-und Maschienfabrik. Cross-coupling for the trucks of a railroad vehicle. 3,854,420, Cl. 105-176.000.

Hirahara, Katsuji, to FMC Corporation. Flexible cable dry peeler. 3,854,395, Cl. 99-630.000.

Hirsch, Jean; and Buret, Jean Pierre, to Laboratories Cassenne. Glycoproteins extracted from microorganisms. 3,855,197, Cl. 260-112.00r.

Hirwe, Asha: *See—*
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, 3,855,313.

Hisashige, Mituto: *See—*
Takizawa, Hidehiko; and Hisashige, Mituto, 3,855,354.

Hitachi Cable Limited: *See—*
Matsui, Kazumi; Umemori, Takashi; Toyoshima, Masahiko; Katakami, Kozo; and Osawa, Susumu, 3,855,485.

Hitachi Chemical Company, Ltd.: *See—*
Maeda, Yo; Asaoka, Masao; Okamura, Toshiro; Nagahama, Sigenori; Yamaguchi, Yutaka; Hoshi, Ikuo; Takaki, Kiyoshi; Masubuchi, Yorimitu; Iigaya, Haruo; and Nakano, Mineo, 3,855,056.

Hitachi, Ltd.: *See—*
Masuda, Hiroo; Masuhara, Toshiaki; Nagata, Minoru; and Kozawa, Tokinori, 3,855,610.
Nemoto, Tadashi; Watanabe, Kiyoshi; Kobayashi, Tadaaki; Ishihara, Joo; Ono, Kenji; and Sonomoto, Kazuhiko, 3,855,015.
Takeda, Yasutsugu; and Oshida, Yoshitada, 3,854,791.
Tomozawa, Akihiro; Nakata, Kensuke; Kikuchi, Akira; and Agatsuma, Takashi, 3,855,112.
Yamada, Yahiko; Okano, Hiroshi; and Yamane, Mikiya, 3,855,499.

Hitachi Metals, Ltd.: *See—*
Nemoto, Tadashi; Watanabe, Kiyoshi; Kobayashi, Tadaaki; Ishihara, Joo; Ono, Kenji; and Sonomoto, Kazuhiko, 3,855,015.

Hobbs, Charles C.; and Bedford, John A., to Celanese Corporation. Production of hydroxy compounds by hydrogenolysis of buffered carboxylate salts. 3,855,319, Cl. 260-635.00d.

Hobson, John Lester: *See—*
Talak, John Frank; and Hobson, John Lester, 3,854,559.

Hochtemperatur-Reaktorbau GmbH: *See—*
Groos, Ekkehard; and Ragoss, Hans, 3,855,058.

Hoechst Aktiengesellschaft: *See—*
Heichlinger, Norbert; and Andiel, Karl, 3,854,313.

Hoechst Aktiengesellschaft, mesne: *See—*
Staendeke, Horst, 3,855,311.

Hoeckelman, Ralph F., to United States Steel Corporation. Method for the uniform electroplating of sheet and strip. 3,855,083, Cl. 204-28.000.

Hoekje, Howard H., to PPG Industries, Inc. Electroconductive, corrosion resistant high silicon alloy. 3,854,940, Cl. 75-134.00s.

Hoerner Waldorf Corporation: *See—*
Hennessey, Russell J., 3,854,580.

Hofer, Friedrich-Wilhelm: *See—*
Herrmann, Walter; Geisler, Heinrich; and Hofer, Friedrich-Wilhelm, 3,854,289.

Hofer, Gerhard, to Siemens Aktiengesellschaft. Method for measuring the chemical carbon and/or nitrogen activities in liquid metals. 3,855,082, Cl. 204-1.00t.

Hoffman, Robert J.; and Follows, Alan G., to Allied Chemical Corporation. Method of producing sodium carbonate and bicarbonate spherules from brine. 3,855,397, Cl. 423-422.000.

Hoffman, Robert J.; and Follows, Alan G., to Allied Chemical Corporation. Sodium carbonate and bicarbonate sperulites from chlorine electrolytic cell liquors. 3,855,398, Cl. 423-422.000.

Hoffmann, Albert: *See—*
Uecker, Emil, 3,854,498.

Hoffmann, Dieter: *See—*
Widiger, Hans; and Hoffmann, Dieter, 3,854,421.

Hoffmann-La Roche Inc.: *See—*
Fitton, Peter; and Whitesides, Thomas, 3,855,338.
Jernow, Jane Liu; and Rosen, Perry, 3,855,250.
Wehrli, Pius Anton, 3,855,306.

Hofmeister, Russell, to Herter's Inc. Force multiplying type archery bow. 3,854,467, Cl. 124-24.00r.

Hoher, Herbert: *See—*
Breu, Karl-Jan; Hoher, Herbert; and Schinke, Hans-Joachim, 3,855,438.

Hoisington, Perry M.; and Boldridge, Austin G., Jr., to HB2 Inc. Heat exchanger for power plants. 3,854,909, Cl. 55-241.000.

Hoke, Neil A. Adjustable eyeglass temple. 3,854,801, Cl. 351-118.000.

Holbrook, Legrand K., to Medical Development Corporation. Method of making fluid collection receptacles. 3,854,191, Cl. 29-453.000.

Holcomb, Jack N.; and Sylten, Hans D., said Sylten assor. to said Holcomb, Jack N.; d/b/a Audio Intelligence Devices. Apparatus for providing power to portable radio transmitters. 3,855,534, Cl. 325-118.000.

Holland, Gerald Fagan, to Pfizer Inc. Acylmethylthio-trifluoromethylbenzoic acids. 3,855,285, Cl. 260-516.000.

Hollandse Signaalapparaten B.V.: *See—*
Van Hijfte, Herman Michel; and Ehbel, Jan Dirk, 3,855,593.

Hollnagel, Harold E. Snowmobile ski suspension assembly with horizontal shock absorber means. 3,854,541, Cl. 180-5.00r.

Holmstrom, Godfrey A., Jr. Vehicle weighing means. 3,854,540, Cl. 177-136.000.

Holtje, Malcolm C., to General Radio Company. Apparatus for high speed resistor trimming. 3,855,109, Cl. 204-228.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Honda, Soichiro; and Satoh, Yasuo, 3,855,573.

Honda, Masanori, to Fujitsu Limited. Light modulation device. 3,854,795, Cl. 350-160.00r.

Honda, Soichiro; and Satoh, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for preventing a drunken driver from operating a motorcar. 3,855,573, Cl. 340-53.000.

Honeywell Inc.: *See—*
Gealt, Arthur E., 3,854,731.

Honeywell Information Systems, Inc.: *See—*
Boyle, Jamie N.; and Decker, Edmund C., Jr., 3,854,374.
Genuit, Luther L., 3,855,518.

Honeywell Information Systems Italia: *See—*
Bertolazzi, Ugo, 3,854,670.
Vettore, Bruno; Enrini, Ferruccio; and Percali, Tullio, 3,855,627.

Hongu, Masayuki: *See—*
Ishigaki, Yoshio; and Hongu, Masayuki, 3,855,551.

Honishi, Hideki: *See—*
Ishii, Hideto; and Honishi, Hideki, 3,854,456.

Hooker Chemicals & Plastics Corporation, mesne: *See—*
Paolieri, Roberto; Pitts, Todd A.; and McCloskey, James W., 3,855,400.

Hoos, Gerald W. Camera flash bracket. 3,855,602, Cl. 354-293.000.

Hoover Ball and Bearing Company: *See—*
West, James E., 3,854,734.

Hoover, John R. E.: *See—*
Dunn, George L.; and Hoover, John R. E., 3,855,213.

Hopkinson, William Ian: *See—*
Gibbs, Dudley Francis; Bennet, Edward John; and Hopkinson, William Ian, 3,854,703.

Hoppesch, Joseph P.: *See—*
Burroughs, James E.; and Hoppesch, Joseph P., 3,854,319.
Burroughs, James E.; Seibert, John W.; and Hoppesch, Joseph P., 3,854,320.

Horacek, Dezideriu: *See—*
Vass, Francis; and Horacek, Dezideriu, 3,854,379.

Horner, Patrick James, to Imperial Chemical Industries Limited. Production of di-4-chlorophenyl sulphone. 3,855,312. Cl. 260-607.00a.

Hosaka, Hirokazu: *See—*
Suda, Hideaki; Dohgane, Iwao; Hosaka, Hirokazu; and Ebara, Kazunari, 3,855,195.

Hoshi, Ikuo: *See—*
Maeda, Yo; Asaoka, Masao; Okamura, Toshiro; Nagahama, Sigenori; Yamaguchi, Yutaka; Hoshi, Ikuo; Takaki, Kiyoshi; Masubuchi, Yorimitu; Iigaya, Haruo; and Nakano, Mineo, 3,855,056.

Hosoi, Takuji; Kanbayashi, Masaaki; Washimi, Koichi; and Gomi, Shimpei. Process for the thermal cracking of hydrocarbons. 3,855,339, Cl. 260-683.00r.

Houck, Deward J., to International Scanatron System Corporation. High stability multiple speed motor power supply for facsimile. 3,855,510, Cl. 318-171.000.

Houze, Gerald L., Jr.: *See—*
Salsgiver, James A.; Houze, Gerald L., Jr.; and Ames, Stuart L., 3,855,018.

Hovermarine Corporation: *See—*
Hall, Arnold M., 3,854,547.

Howard, Frank L.: *See—*
McDole, Ewell E.; and Howard, Frank L., 3,855,136.

Howell, Robert B. Presser foot attachments. 3,854,432, Cl. 112-235.000.

Hoye, Peter Albert Theodore: *See—*
Wilkins, Anthony James; and Hoye, Peter Albert Theodore, 3,855,179.

Hoyle, Vinton A., Jr., to Eastman Kodak Company. Synthesis of indoliniium methine dyes. 3,855,209, Cl. 260-240.00e.

Hoyler, Gerhard, to Siemens Aktiengesellschaft. Self healing capacitors. 3,855,507, Cl. 317-258.000.

Hrboticky, Karel: *See—*
Brackmann, Warren A.; Bunnell, Arthur K.; and Hrboticky, Karel, 3,854,652.

Huang, Tracy J.; and Yurchak, Sergei, to Mobil Oil Corporation. Isoparaffin-olefin alkylation with a complex of a macroreticular acid cation exchange resin and BF_3. 3,855,342, Cl. 260-683.440.

Huang, Tracy J.; and Yurchak, Sergei, to Mobil Oil Corporation. Isoparaffin-olefin alkylation with regeneration of resin/boron trifluoride catalyst. 3,855,343, Cl. 260-683.440.

Huber, Robert J.; Fordemwalt, James N.; and Smith, Kent F., to General Instrument Corporation. MOS integrated circuit process. 3,855,008, Cl. 148-1.500.

Huck, Rodney M.; and Leblanc, John R., to Monsanto Company. High temperature stable modified aromatic aminealdehyde molding powders modified with aromatic polycarboxylic acid, and molded article. 3,855,173, Cl. 260-39.00r.

Hueber, Peter: *See—*
Manner, Roland; and Hueber, Peter, 3,854,785.

Huebler, Jack; Massey, Lester G.; and Tarman, Paul B., to Consolidated Natural Gas Service Co., Inc. Oxygen enrichment process. 3,855,403, Cl. 423-579.000.

Huener, Robert Charles; and Fillmore, Richard Plumb, to RCA Corporation. Circuit, such as CMOS crystal oscillator, with reduced power consumption. 3,855,549, Cl. 331-108.00d.

Hughes Aircraft Company: *See—*
Bell, Curtis C.; and Forward, Robert L., 3,854,340.
Bilow, Norman, 3,855,273.
Burnham, John, 3,854,980.
Keller, Leon B., 3,855,598.

Huhta-Koivisto, Esko Ensio, to Puolustusministerio. Device in a galvanic battery for removing air from the electrolyte and water supply ducts and from the electrolyte tank when the battery is started. 3,855,005, Cl. 136-100.00r.

Hull, Charles Hartley, to Brown, David, Tractors Limited. Auxiliary driven axles. 3,854,543, Cl. 180-14.00a.

Humphrey, Victor William Stanley, to GKN Sankey Ltd. and ARO Plastics Development Limited. Apparatus for moulding plastic articles. 3,854,691, Cl. 249-91.000.

Hunke, Siefried H. Rotary accumulation device. 3,854,675, Cl. 242-154.000.

Hunt, Ronald Eugene; and Jenkins, William Melchior, to International Business Machines Corporation. Informatic., media handling system. 3,854,784, Cl. 312-319.000.

Hunter, Edwin J., to Toro Company, The. Automatic controller drive machanism. 3,854,346, Cl. 74-568.00t.

Hunter, Edwin J., to Toro Company, The. Sprinkler systems. 3,854,664, Cl. 239-206.000.

Hunter, William L.; Paulson, Danton L.; and Stickney, William A., to United States of America, Interior. Smelting of nickel oxide ores to produce ferronickel. 3,854,936, Cl. 75-82.000.

Hurford, Winslow Leroy, to RCA Corporation. PWM multiplex system. 3,855,419, Cl. 179-15.0aw.

Huschle, Peter: *See—*
Ettischer, Helmut; and Huschle, Peter, 3,854,810.

Hushower, Richard R.: *See—*
Jesswein, Ronald M.; Hushower, Richard R.; and Duttarer, Ralph M., 3,854,542.

Huska, Paul: *See—*
McNeely, Arthur O.; Kennedy, Wiley T.; and Huska, Paul, 3,855,031.

Husqvarna Vapenfabriks Aktiebolag: *See—*
Andersson, Kjell Arne, 3,854,546.

Hutchins, Alma A. Piercing of suction holes in sanding discs. 3,854,206, Cl. 30-368.000.

Hutchins, Burleigh M., Jr.: *See—*
Abrahams, Louis; Hutchins, Burleigh M., Jr.; and Waters, James L., 3,855,129.

Hutchins, Burleigh M., Jr., to Waters Associates, Inc. Motor control circuit. 3,855,515, Cl. 318-685.000.

Hutson, Thomas, Jr.; and Makovec, Donald J., to Phillips Petroleum Company. Alkylation of isobutane with ethylene and with aluminum halide hydrocarbon complex catalyst using two reactors in series. 3,855,345, Cl. 260-683.450.

Huybrechts, Roger Joseph: *See—*
Vandeputte, Camille Angelina; Huybrechts, Roger Joseph; Gallois, Daniel Jean; and Verbrugghe, Roland Gaston, 3,854,944.

Hyde, William J.: *See—*
Franke, Edward L., Jr.; and Hyde, William J., 3,854,444.

Hydril Company: *See—*
Mott, James D., 3,854,502.

Hydroplastics, Inc.: *See—*
Aelion, Rene; and Ferezy, Edward, 3,854,982.

Hyland, William J.: *See—*
Karlik, Steven, Jr.; Hyland, William J.; and Souza, Edward A., 3,855,505.

I-T-E Imperial Corporation: *See—*
Gryctko, Carl E., 3,855,557.
Pardue, Von G.; and Cataldo, John B., 3,855,502.

Iarrera, Stefano: *See—*
Inzoli, Giovanni; and Arosio, Enrico, 3,854,648.

Ichihashi, Osamu, to Yashica Co., Ltd. Shutter operating circuits for photographic cameras. 3,855,603, Cl. 354-51.000.

Ichiki, Mitsuo: *See—*
Konno, Minoru; and Ichiki, Mitsuo, 3,854,344.

ICI America, Inc.: *See—*
Gatos, George C., 3,855,237.

ICI Australia Limited: *See—*
Stewart, Donald Fergusson; and Pollard, Leslie John, 3,854,929.

Iigaya, Haruo: *See—*
Maeda, Yo; Asaoka, Masao; Okamura, Toshiro; Nagahama, Sigenori; Yamaguchi, Yutaka; Hoshi, Ikuo; Takaki, Kiyoshi; Masubuchi, Yorimitu; Iigaya, Haruo; and Nakano, Mineo, 3,855,056.

Ikeda, Tadashi: *See—*
Shiba, Keisuke; Hinata, Masanao; Sato, Akira; Ogawa, Akira; and Ikeda, Tadashi, 3,854,955.

Ikegami, Yoshizo, to Konan Camera Research Institute. Radiograph recording apparatus. 3,855,471, Cl. 250-320.000.

Iler, Ralph K.; and McQueston, Herbert J., to Du Pont de Nemours, E. I., and Company. Uniform oxide microspheres and a process for their manufacture. 3,855,172, Cl. 260-39.00r.

Illg, Manfred, to Suddeutsche Kuhlerfabrik Julius Fr. Behr, Firma. Air conditioning plant, particularly for motor vehicles. 3,854,525, Cl. 165-42.000.

Illinois Railway Equipment Company: *See—*
Sweger, Theodore J., 3,854,422.

Illinois Tool Works Inc.: *See—*
Bernin, Victor Maurice, 3,855,525.

Im, Suk Joong: *See—*
Dubeck, Michael; and Im, Suk Joong, 3,855,384.

Imhagen, Karl-Heinz; Kasper, Werner; Manhart, Gernot; and Werner, Weidner, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture or closing of sacks by welding cut lengths of tube of thermoplastics. 3,855,037, Cl. 156-497.000.

Imperial Chemical Industries Limited: *See—*
Billany, Michael Royston; Longworth, Arthur Raymond; and Shatwell, John, 3,855,140.
Costain, Winston; and Terry, Bernard William Hugh, 3,854,959.
Horner, Patrick James, 3,855,312.
Joy, David Richard; and Jhawar, Sohanlal, 3,855,326.
Oldham, Joseph; and Duxbury, Frederick Keith, 3,855,350.
Pioli, Alexander Joseph Peter, 3,855,258.
Roy, Thomas Paterson, 3,855,234.

Imperial Metal Industries (Kynoch) Limited: *See—*
Knights, Richard Northan, 3,854,645.

Inami, Kenichi: *See—*
Yamazaki, Shigezo; Wakao, Mitsuru; and Inami, Kenichi, 3,854,598.

Indian Head Inc., mesne: *See—*
Harmuth, Joseph T., 3,854,439.

Indre, Robert S.: *See—*
Allinger, Hubert B.; Gray, Glen G.; Indre, Robert S.; and Kelly, Robert J., 3,855,455.

Industrial Nucleonics Corporation: *See—*
Chope, Henry Roy, 3,855,467.
Crawford, Juan Hamilton, 3,855,524.

Industrial Research Products, Inc.: *See—*
Burkhard, Mahlon D.; and Peters, Richard W., 3,855,555.

Industrie Pirelli Societa per Azioni: *See—*
Ferrentino, Antonio, 3,854,698.

Inmont Corporation: *See—*
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Innes, William P.: *See—*
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Inoue, Shigeharu: *See—*
Omoto, Shoji; Inoue, Shigeharu; and Niida, Taro, 3,855,202.

Inoue, Shigejiro: *See—*
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Inpaver AG: *See—*
Degen Felix, 3,854,154.

Institut Francais du Petrole des Carburants et Lubrifiants: *See—*
Cheron, Jacques, 3,855,001.

Instrumentation Laboratory, Inc.: *See—*
Haddad, Ihsan A., 3,855,100.

Instrumentation Specialties Company: *See—*
Allington, William B., 3,855,111.

Intel Corporation: *See—*
Baerg, William, 3,854,443.
Karp, Joel A.; and Regitz, William M., 3,855,483.

Interlake, Inc.: *See—*
Winkler, Alvin L., 3,854,315.

International Business Machines Corporation: *See—*
Amundson, Lonald Lloyd; Beuch, Wallace Eric; Green, Charles Donald; and Harris, William John, 3,855,457.
Cadiou, Jean Jacques; Guerinet, Georges Rene; Callens, Paul Raymond; and Tracol, Andre G., 3,855,422.
Cowardin, Robert L.; Matuck, George C.; McCray, Charles M.; Powell, Flavius M.; Pratt, Woodrow W.; Thomas, Delbert C., Jr.; and Thorne, William D., 3,854,563.
Croisier, Alain, 3,855,539.
Garnier, Michael F.; Tang, Tung-Men; and White, James W., 3,855,625.

Hunt, Ronald Eugene; and Jenkins, William Melchior, 3,854,784.
Kirk, Joseph Pennell, 3,855,547.
Magdo, Ingrid E.; and Magdo, Steven, 3,855,609.
Peterson, Charles E.; and Schaefer, Donald W., 3,854,604.
Proper, Davis S.; and Rueger, William J., 3,854,605.
Schneider, Richard C., 3,855,616.

International Computers Limited: *See—*
Ridgway, Peter Charles, 3,854,199.

International Scanatron System Corporation: *See—*
Houck, Deward J., 3,855,510.

International Shoe Machine Corporation: *See—*
Vornberger, Walter, 3,854,250.
Vornberger, Walter, 3,854,830.

International Standard Electric Corporation: *See—*
Colardelle, Joel Serge; Girard, Pierre; and Lerouge, Claude Paul Henri, 3,855,430.
Pilling, Harold William Cliff; and Le Cardonnel, Gerard Marcel, 3,855,421.

International Synthetic Rubber Company Limited, The: *See—*
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International Telephone and Telegraph Corporation: *See—*
Erdmann, Manfred O.; and Dolan, John J., 3,855,027.
Fischer, Allen Herbert, 3,855,570.
Garnett, Lawrence Taylor, 3,854,335.
Goodman, David S., 3,854,788.
Robison, James Ray, 3,854,884.
Stewart, Alan, 3,855,431.

Investors in Ventures, Inc.: *See—*
Bucalo, Louis, 3,854,475.

Inzoli, Giovanni; and Arosio, Enrico, to Iarrera, Stefano. Air operated fastener driving tool especially for tacks. 3,854,648, Cl. 227-136.000.

Ishigaki, Yoshio; and Hongu, Masayuki, to Sony Corporation. Multivibrator circuit. 3,855,551, Cl. 331-113.00r.

Ishihara, Joo: *See—*
Nemoto, Tadashi; Watanabe, Kiyoshi; Kobayashi, Tadaaki; Ishihara, Joo; Ono, Kenji; and Sonomoto, Kazuhiko, 3,855,015.

Ishii, Hideto; and Honishi, Hideki, to Nissan Motor Company, Limited. Rotary internal combustion engines. 3,854,456, Cl. 123-8.450.

Ishikawajima-Horima Jukogyo Kabushiki Kaisha: *See—*
Kobayashi, Akio; Yamada, Tadao; Kawakami, Masuo; Ishioka, Hitoshi; and Nishiura, Hideyuki, 3,854,265.

Ishioka, Hitoshi: *See—*
Kobayashi, Akio; Yamada, Tadao; Kawakami, Masuo; Ishioka, Hitoshi; and Nishiura, Hideyuki, 3,854,265.

Iszwa, Shinichi: *See—*
Nakajima, Hitoshi; Nomura, Fujio; and Iszwa, Shinichi, 3,855,318.

Itagaki, Tadasi, to Pioneer Electronic Corporation and Tokorozawa Electronics Corporation. Speaker diaphragm. 3,855,428, Cl. 179-115.5es.

Itek Corporation: *See—*
Keller, Juergen H. H., 3,855,210.

Ito, Haruo: *See—*
Matsukawa, Hidehiko; Ito, Haruo; and Suzuki, Taneko, 3,855,196.

Ito, Kazuo: *See—*
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IU Conversion Systems, Inc.: *See—*
Minnick, Leonard John; Webster, William C.; and Smith, Charles L., 3,854,968.

Ivanenko, Larisa Akimovna: *See—*
Kotova, Valentina Georgievna; Akopian, Gretel Artashesovna; Galitsky, Anatoly Ivanovich; Golin, Jury Petrovich; Snezhko, Valery Grigorievich; Kolesnichenko, Leonid Georgievich; Ivanenko, Larisa Akimovna; and Nekrasov, Jury Fedorovich, 3,855,446.

Iwasaki, Yukio: *See—*
Suzuki, Yoshinori; and Iwasaki, Yukio, 3,854,985.

Jablonski, Raymond C. Arm propelled cycle. 3,854,754, Cl. 280-242.00r.

Jackson, Norman W.: *See—*
Molins, Desmond W.; Labbe, Francis A. M.; Preston, Edward G.; and Jackson, Norman W., 3,854,487.

Jackson, Richard R. Endotracheal tube with liquid fillable cuff. 3,854,484, Cl. 128-351.000.

Jacobs, James W., to General Motors Corporation. Fluid powered ultrasonic washing, rinsing, and drying system for a dishwasher. 3,854,998, Cl. 134-191.000.

Jacobs, Thomas A., to Tideland Signal Corporation. Navigational light system. 3,855,586, Cl. 340-251.000.

Jacobs, Thomas A., to Tideland Signal Corporation. Navigational light system. 3,855,587, Cl. 340-251.000.

James, John William: *See—*
Chapman, Norman Bellamy; Clarke, Kenneth; and James, John William, 3,855,242.

Jamet, Bruno, to Rhone-Poulenc S.A. Apparatus for separating fluids. 3,854,904, Cl. 55-158.000.

Jammet, Jean, to Saft-Societe des Accumulateurs Fixes et de Traction. Air depolarization primary cell and process for production thereof. 3,855,000, Cl. 136-86.00a.

Janda, Joseph F. Turntables for heavy objects. 3,854,404, Cl. 104-44.000.

Jankowski, Gene S.; and Kibelbek, Joseph A., to Westinghouse Electric Corporation. Universal digital data system. 3,855,617, Cl. 360-62.000.

Janome Sewing Machine Co., Ltd.: *See—*
Hanyu, Susumu, 3,854,433.

Janosko, Michael J. Patio canopy structure. 3,854,254, Cl. 52-63.000.

Janousek, Zdenek: *See—*
Viehe, Heinz Gunter; and Janousek, Zdenek, 3,855,293.

Janson, Sven-Olof. Humidifier for sauna rooms. 3,854,662, Cl. 236-44.00c.

Janssen, Joannes Franciscus Maria: *See—*
Merz, Josef; Van Esdonk, Johannes; and Janssen, Joannes Franciscus Maria, 3,854,827.

Japan Atomic Energy Research Institute: *See—*
Araki, Kunio; Sasaki, Takashi; and Nishio, Keiji, 3,855,379.
Furukawa, Kazuo; Kato, Yoshio; Ohno, Hideo; and Katsuta, Hiroji, 3,854,933.

Japan Exlan Company Limited: *See—*
Takeya, Kenji; Kobashi, Toshiyuki; and Masuhara, Kenichi, 3,855,382.

Japan Society for the Promotion of Machine Industry: *See—*
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Japanese National Railway: *See—*
Matsui, Kazumi; Umemori, Takashi; Toyoshima, Masahiko; Katakami, Kozo; and Osawa, Susumu, 3,855,485.

Japanese National Railways: *See—*
Yamazaki, Shigezo; Wakao, Mitsuru; and Inami, Kenichi, 3,854,598.

Jefferson Chemical Company, Inc.: *See—*
Watts, Lewis William, Jr.; Yeakey, Ernest Leon; and Moss, Philip Hotchkiss, 3,855,264.

Jenkins, William Melchior: *See—*
Hunt, Ronald Eugene; and Jenkins, William Melchior, 3,854,784.

Jensen, Garold K.; and McGeogh, James E., to United States of America, Navy. Frequency spectrum display for radar. 3,855,595, Cl. 343-8.000.

Jernow, Jane Liu; and Rosen, Perry, to Hoffmann-La Roche Inc. Certain 2-oxo-2H-cyclopenta (b)-furans. 3,855,250, Cl. 260-343.300.

Jesevich, John; and Simkus, Vyto, to American Flange & Manufacturing Co., Inc. Closure feeding apparatus. 3,854,600, Cl. 214-1.0bb.

Jesswein, Ronald M.; Hushower, Richard R.; and Duttarer, Ralph M., to Clark Equipment Company. Modular vehicle coupling. 3,854,542, Cl. 180-12.000.

Jhawar, Sohanlal: *See—*
Joy, David Richard; and Jhawar, Sohanlal, 3,855,326.

Johansson, Gillis: *See—*
Sharp, Michael; and Johansson, Gillis, 3,855,097.

Johnke, Winfried: *See—*
Steinberg, Diedrich; Johnke, Winfried; Roth, Helmut; Ruf, Walter; Steinbrenner, Ulrich; and Linstedt, Hans, 3,854,466.

Johns-Manville Corporation: *See—*
Morrison, Robert S.; and Hesse, Jack E., 3,854,504.

Johnson & Johnson: *See—*
Campbell, Roger G., Sr.; Goff, Richard E., Jr.; and Staffier, Thomas L., 3,854,978.

Johnson, Barry C.: *See—*
Pops, Horace; and Johnson, Barry C., 3,854,200.

Johnson, Wayne F.: *See—*
Burtis, Carl A.; Johnson, Wayne F.; and Walker, William A., 3,854,508.

Johnston, Dickie L.: *See—*
Willis, Wilfred Ernest; and Johnston, Dickie L., 3,854,616.

Johnston, Harlin D., to Phillips Petroleum Company. Barium promoted iron oxide catalyst suited for use in steam-iron process for producing hydrogen. 3,855,155, Cl. 252-473.000.

Johnston, James F. Laterally and longitudinally extensible truck. 3,854,747, Cl. 280-34.00b.

Johnston, James G., to Stanray Corporation. Shock absorbing apparatus for heavy loads. 3,854,706, Cl. 267-116.000.

Johnston, Walker F.: *See—*
Lovell, Lyle M.; Johnston, Walker F.; and Kramer, Gerald J., 3,854,637.

Jones, Arthur R., Jr.: *See—*
Fromm, Bernard W.; Silvestri, Achille; and Jones, Arthur R., Jr., 3,854,885.

Jones, Edwin K. Isobutane flashing in the alkylation of C_2-C_3 olefin hydrocarbons with isobutane. 3,855,344, Cl. 260-683.460.

Jones, Ernest Charles, Jr., to Monarch Marking Systems, Inc. Pressure-sensitive material and supporting material combination. 3,854,581, Cl. 206-460.000.

Jones, Graham Robin Scott, to Masson Scott Trissell Engineering, Ltd. Apparatus for web tension measurement. 3,854,329, Cl. 73-143.000.

Jones, John M., to Texaco Inc. Means and method for providing highly stable reference pulses. 3,855,538, Cl. 328-175.000.

Jones, John P. Threaded mounting sleeve with relatively pivotable end sections. 3,854,828, Cl. 403-100.000.

Jones, Robert N., to Xerox Corporation. Translating dwell cleaning system. 3,854,814, Cl. 355-15.000.

Jones, Stanley Peter, to Emhart Corporation. Glass mold cooling systems. 3,854,921, Cl. 65-161.000.

Jonson, S. C., & Son, Inc.: *See—*
Conway, John J.; and Evesque, Roger A., 3,854,636.

Jordan, Bertram L. Log grapple device. 3,854,766, Cl. 294-88.000.

Jouet, Etienne; and Rebuffe, Pascal. Heat exchanger. 3,854,530, Cl. 165-163.000.

Joy, David Richard; and Jhawar, Sohanlal, to Imperial Chemical Industries Limited. Production of olefinic hydrocarbons. 3,855,326, Cl. 260-666.000.

Judkins, Herbert T.; and Miller, Lucian C. Ambulatory amusement and exercise device. 3,854,717, Cl. 272-70.000.

Jukes, Norman Alfred, to Lucas, Joseph, (Electrical) Limited. Vacuum units. 3,854,461, Cl. 123-117.00a.

Jungkind, Roland: *See*—
Marker, Hannes; and Jungkind, Roland, 3,854,741.

Jungle, Nils Ake Curt, to AB Gotaverken. Device for interconnecting two plates. 3,855,445, Cl. 219-121.0eb.

Junker, Bernhard T., to Monsanto Company. Melt extrusion method for producing wire from steel alloys. 3,854,518, Cl. 164-66.000.

Junker, Bernhard T., to Monsanto Company. Apparatus for starting extrusion of filaments from metallic melts. 3,854,519, Cl. 164-274.000.

Junkin, James H.; Ginn, Martin E.; and Fronczak, Ernest T., to Alberto-Culver Company. Powder-resistant acrylic polymer floor finishes. 3,855,170, Cl. 260-29.6rw.

Kabushiki Kaisha: *See*—
Himi, Hitoshi, 3,855,435.

Kabushiki Kaisha Seikosha: *See*—
Samejima, Toshihide; and Ooi, Yasuhiro, 3,854,277.

Kabushiki Kaisha Suwa Seikosha: *See*—
Takeshita, Hiroshi; and Teraishi, Katsuhito, 3,854,278.

Kabushiki Kaisha Tadapura: *See*—
Teranishi, Takeo, 3,854,783.

Kabushiki Kaisha Tagami Kanagata: *See*—
Tagami, Shuji, 3,854,359.

Kabushiki Kaisha Toyo Seisakusho: *See*—
Nishioka, Masanari; Tomatsu, Fumio; and Fukami, Ryuzoo, 3,854,507.

Kahn, Frederic Jay, to Bell Telephone Laboratories, Incorporated. Liquid crystal cells. 3,854,793, Cl. 350-160.0lc.

Kahr, Kurt: *See*—
Becker, Lothar; Kahr, Kurt; Rapp, Guenther; and Mannheim, Otto Waschka, 3,855,080.

Kaiser Aluminum & Chemical Corporation: *See*—
McDole, Ewell E.; and Howard, Frank L., 3,855,136.

Kakizaki, Tetsuji. Process for preparing novel glass fiber reinforced thermoplastic composition. 3,855,175, Cl. 260-42.150.

Kalen, Bodo, to Ducon Company, The. Method of filtering gas. 3,854,902, Cl. 55-96.000.

Kallianos, Andrew G.: *See*—
Mold, James D.; Kallianos, Andrew G.; Means, Richard E.; and Simpson, Melvyn L., 3,854,485.

Kaminski, Elton G.: *See*—
Stolle, Ralph J.; Hasselbeck, Richard J.; and Kaminski, Elton G., 3,854,445.

Kaminsky, Daniel; Klutchko, Sylvester; and Von Strandtmann, Maximilian, to Warner-Lambert Company. Substituted pyrano(3,2-c)(1,2) benzothiazine 6,6-dioxides. 3,855,216, Cl. 260-243.00r.

Kamner, Haim J., to Goodman Equipment Corporation. Traction assist means for loading machines and the like. 3,854,607, Cl. 214-140.000.

Kamo, Mitsunori, to Mitsubishi Pencil Co., Ltd. Mechanical pencil. 3,854,824, Cl. 401-65.000.

Kamre Corporation: *See*—
Manning, Eugene P., 3,854,673.

Kanbara, Kenjiro; Nagai, Satoshi; and Yanagi, Hiroki, to Nippon Steel Corporation. Castable refractories for the use of an impeller to stir molten pig iron to which an alkaline additive is added. 3,854,966, Cl. 106-64.000.

Kanbayashi, Masaaki: *See*—
Hosoi, Takuji; Kanbayashi, Masaaki; Washimi, Koichi; and Gomi, Shimpei, 3,855,339.

Kane, James, to RCA Corporation. Process for depositing electrically conductive indium oxide coatings on a substrate. 3,854,992, Cl. 117-201.000.

Kaneyasu, Mutsumi: *See*—
Okabe, Jiro; Machihara, Akira; Kaneyasu, Mutsumi; and Kato, Kojiro, 3,854,995.

Kanno, Isawo; Takashima, Toshiyuki; and Bokuda, Yoshiyuki, to Seikisui Kagaku Kogyo Kabushiki Kaisha. Laminated safety glass and interlayer therefor. 3,855,055, Cl. 161-199.000.

Kaplan, Eric S. Connector for coaxial cable. 3,854,789, Cl. 339-177.00r.

Kapoor, Inder: *See*—
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, 3,855,313.

Karlik, Steven, Jr.; Hyland, William J.; and Souza, Edward A., to National Components Industries, Inc. Solid electrolyte capacitor. 3,855,505, Cl. 317-230.000.

Karp, Joel A.; and Regitz, William M., to Intel Corporation. Memory system incorporating a memory cell and timing means on a single semiconductor substrate. 3,855,483, Cl. 307-279.000.

Karpenko, Leonty Petrovich: *See*—
Medem, Vulf Matveevich; Boldrev, Sergei Andreevich; Karpenko, Leonty Petrovich; Dolukhanov, Rafik Tsaturovich; and Sergeev, Nikolai Sergeevich, 3,855,116.

Kasper, Werner: *See*—
Imhagen, Karl-Heinz; Kasper, Werner; Manhart, Gernot; and Werner, Weidner, 3,855,037.

Katakami, Kozo: *See*—
Matsui, Kazumi; Umemori, Takashi; Toyoshima, Masahiko; Katakami, Kozo; and Osawa, Susumu, 3,855,485.

Katayama, Hajime: *See*—
Yamaji, Keizo; Katayama, Hajime; Takahashi, Toru; Ohashi, Shoji; and Nishigaki, Yuji, 3,854,224.

Kato, Kojiro: *See*—
Okabe, Jiro; Machihara, Akira; Kaneyasu, Mutsumi; and Kato, Kojiro, 3,854,995.

Kato, Saburo, to Ricoh Co., Ltd. Head feed means for magnetic spiral track recorder having two heads. 3,855,620, Cl. 360-101.000.

Kato, Toshio; and Shibuya, Chisei, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing dialkyl (ethylenedioxy) bis-benzoate. 3,855,274, Cl. 260-473.00r.

Kato, Yoshio: *See*—
Furukawa, Kazuo; Kato, Yoshio; Ohno, Hideo; and Katsuta, Hiroji, 3,854,933.

Katsuta, Hiroji: *See*—
Furukawa, Kazuo; Kato, Yoshio; Ohno, Hideo; and Katsuta, Hiroji, 3,854,933.

Kattenberg, Hans Robert: *See*—
Haighton, Adolf Johan; and Kattenberg, Hans Robert, 3,855,254.

Katum Corporation: *See*—
Farmer, Robert B., 3,855,476.

Katz, Sidney, to Mosstype Corporation. Demountable printing cylinders. 3,854,184, Cl. 29-123.000.

Kaufman, Arthur L. Electrostatic printing apparatus using charge induced toning. 3,854,813, Cl. 355-10.000.

Kavanagh, Thomas S.: *See*—
Herger, Zoltan L.; Kavanagh, Thomas S.; Olmsted, Dennis R.; and Campbell, Ronald R., 3,854,674.

Kawakami, Masuo: *See*—
Kobayashi, Akio; Yamada, Tadao; Kawakami, Masuo; Ishioka, Hitoshi; and Nishiura, Hideyuki, 3,854,265.

Kawamoto, Akio: *See*—
Ono, Kazuo; Tsuchiya, Tadao; Kawamoto, Akio; and Nakada, Jun, 3,855,376.

Kawamoto, Hirohisa, to RCA Corporation. Carrier injected avalanche device. 3,855,605, Cl. 357-13.000.

Kay Laboratories, Inc.: *See*—
Williams, Vernon L., 3,854,156.

Kay, Soloman Elijah; and Pickard, John, to Triplex Safety Glass Company Limited. High temperature bending. 3,854,920, Cl. 65-106.000.

Kegelman, Matthew Roland, to Du Pont de Nemours, E. I., and Company. High energy density battery heat fusible venting means. 3,855,006, Cl. 136-177.000.

Kehr, Clifton Leroy; and Marans, Nelson S., to Grace, W. R., & Co. Fire inhibiting foam system. 3,854,535, Cl. 169-48.000.

Keiser, Bernhard E. Delay line time compressor and expander. 3,855,425, Cl. 179-15.55t.

Kelch, Heinz: *See*—
Helmschrott, Norbert; Kelch, Heinz; Schuh, Eduard; and Zimmermann, Hans, 3,855,599.

Keller & Knappich Augsburg Zweigniederlassung der Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See*—
Schiele, August, 3,854,377.

Keller, Juergen H. H., to Itek Corporation. Bis(hydroxyalkyl)styryl dye compounds and photosensitive media containing such compounds. 3,855,210, Cl. 260-240.900.

Keller, Leon B., to Hughes Aircraft Company. Mesh articles particularly for use as reflectors of electromagnetic waves. 3,855,598, Cl. 343-840.000.

Kelly, James E.; Shooter, Kenneth L.; and Lawter, Ray L., to NCR Corporation. Drawer position sensing latch operated switch assembly. 3,855,432, Cl. 200-61.610.

Kelly, John: *See*—
Kelly, William; and Halpern, Alfred, 3,855,282.

Kelly, Monica: *See*—
Kelly, William; and Halpern, Alfred, 3,855,282.

Kelly, Robert J.: *See*—
Allinger, Hubert B.; Gray, Glen G.; Indre, Robert S.; and Kelly, Robert J., 3,855,455.

Kelly, William; deceased (by Kelly, Monica; and Kelly, John; representatives); and Halpern, Alfred, to Mundipharma AG. Stabilized choline salicylate compounds. 3,855,282, Cl. 260-501.150.

Kendall, Jack B.; and Nordahl, James H., to Atlantic Richfield Company. High capacity geometrically-favorable solvent extraction columns for processing fissile materials. 3,854,176, Cl. 23-267.00c.

Kennecott Copper Corporation: *See*—
Skarbo, Roald R., 3,855,090.

Kennedy, James D., to Beatrice Foods Company. Spoke mountable bracket assembly. 3,854,777, Cl. 301-37.0sa.

Kennedy, Wiley T.: *See*—
McNeely, Arthur O.; Kennedy, Wiley T.; and Huska, Paul, 3,855,031.

Kenney, John Thomas, to Western Electric Company, Incorporated. Photosensitive silver halide composition. 3,854,952, Cl. 96-94.0bf.

Kenrick, Archibald, & Sons Limited: *See*—
Burnell, Hughie, 3,854,516.

Kensruf, Milo M. Scaffold planking clamp. 3,854,552, Cl. 182-222.000.

Kent Plastics Corporation: *See*—
Haag, John Henry, 3,854,860.

Kentro, Dan M., to Molybdenum Corporation of America. Process for the removal of lead from molybenite. 3,854,930, Cl. 75-1.000.

Kercher, Dean S.; and Rod, Trygve R., to Xerox Corporation. Quick change labeling head. 3,854,361, Cl. 83-499.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Demmeler, Martin, 3,855,475.

Kerr, Edwin R.: *See*—
Estes, John H.; Kerr, Edwin R.; and Dorawala, Tansukhlal G., 3,855,335.

Kerr, John T.: *See*—
Polata, Bohumil; Marley, James A., Jr.; and Kerr, John T., 3,855,007.

Kerwood, Joseph Edward: *See*—
Coran, Aubert Yaucher; and Kerwood, Joseph Edward, 3,855,262.

Kestner, Daniel W.: *See*—
Selmeczi, Joseph G.; and Kestner, Daniel W., 3,855,391.

Keur, Robert I.; and Dahl, Henry A., to Dick, A. B., Company. Method and means for operating an ink jet printer without splatter. 3,854,399, Cl. 101-426.000.

Keyes, John Harold Crawford; and Napier, George William, to Young, Jas., & Cunningham (Newcastle) Limited. Fluid flow valve. 3,854,696, Cl. 251-163.000.

Khvostantsev, Lev Grigorievich: *See*—
Vereschagin, Leonid Fedorovich; and Khvostantsev, Lev Grigorievich, 3,854,854.

Kibelbek, Joseph A.: *See*—
Jankowski, Gene S.; and Kibelbek, Joseph A., 3,855,617.

Kiehs, Karl; Koenig, Karl-Heinz; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for controlling the growth of unwanted plants. 3,854,927, Cl. 71-121.000.

Kienzle Apparate GmbH: *See*—
Helmschrott, Norbert; Kelch, Heinz; Schuh, Eduard; and Zimmermann, Hans, 3,855,599.

Kiesow, Kutz A., to Baxter Laboratories, Inc. Method and apparatus for deriving oxygen association rate curves for blood samples. 3,854,878, Cl. 23-230.00b.

Kikuchi, Akira: *See*—
Tomozawa, Akihiro; Nakata, Kensuke; Kikuchi, Akira; and Agatsuma, Takashi, 3,855,112.

Killian, Gerald I. Elevation adjustment mechanism for archery bow sights. 3,854,217, Cl. 33-265.000.

Kilp, Frithjof Ernst Josef, to Starck, Herman C. Weld additive for electric-arc deposit welding. 3,855,447, Cl. 219-145.000.

Kimberly-Clark Corporation: *See*—
Brock, Robert J., 3,855,045.
Hansen, Paul Bernard; and Pennings, Leon Benjamin, 3,855,046.

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Toda, Takashi; Kimizuka, Katsumi; and Takahashi, Iwao, 3,854,739.

Kimmelmann, Carl E., 1/2 to Braelow, David B. Method and apparatus for activation of an abrasive slurry by an electric arc. 3,855,441, Cl. 219-68.000.

Kimoto, Zitumi: *See*—
Ueda, Kouzo; and Kimoto, Zitumi, 3,854,850.

Kinard, William C., to Relton Corporation. Tennis racket rack. 3,854,588, Cl. 211-13.000.

King, Charles W.: *See*—
Fox, Robert C.; Altman, James S.; and King, Charles W., 3,855,415.

King, Donald E., to Ayr-King Corporation. Range hood air cleaning device. 3,854,388, Cl. 98-115.00k.

King, Lloyd H., Sr. Pipe pulling device. 3,854,768, Cl. 294-102.00r.

Kinnune, William P., Jr., to Western Kraft Corporation. Locking means for suspension member in suspendible load spacer. 3,854,426, Cl. 105-369.00b.

Kinoshita, Yoshitaka, to Sumitomo Shipbuilding & Machinery Co., Ltd. Installation for assemblying ship hull subassemblies. 3,854,435, Cl. 114-65.00r.

Kirk, Donald G.: *See*—
Hildebrand, Donald L.; Prescott, Ernest F.; and Kirk, Donald G., 3,854,160.

Kirk, Joseph Pennell, to International Business Machines Corporation. Optical cavity for a laser. 3,855,547, Cl. 331-94.50c.

Kishi, Ikuji: *See*—
Fukuda, Makoto; Nakano, Tatsuo; and Kishi, Ikuji, 3,855,166.

Kistler, Laurenz. Support system for concrete forms. 3,854,693, Cl. 249-210.000.

Kita, Yasuo, to Shimadzu Seisakusho, Ltd. Gear type flow divider. 3,854,492, Cl. 137-99.000.

Kitagami, Hisashi: *See*—
Hatanaka, Yoshihiro; Shigemori, Hideto; and Kitagami, Hisashi, 3,854,490.

Kiuchi, Masao, to Sony Corporation. Transformer having switch means for causing series or parallel connection between plural primary or secondary windings. 3,855,521, Cl. 323-49.000.

Klass, Donald L.; and Landahl, Carl D. Permeant gas method and apparatus. 3,854,894, Cl. 48-195.000.

Klees, Garry W., to Boeing Company, The. Variable bypass engines. 3,854,286, Cl. 60-204.000.

Klein, Erich, to Dragoco Spezialfabrik Konz, Riech- und Aromastoffe Gerberding & Co. GmbH. Method of protecting the skin with 5-(3,3-dimethyl-2-norbornylidene)-3-pentene-2-one. 3,855,407, Cl. 424-59.000.

Klein, Max, to Normac, Inc. Composite polymer products for that. 3,855,049, Cl. 161-160.000.

Klimisch, Richard L., to General Motors Corporation. Method of treating exhaust gases of internal combustion engines. 3,855,389, Cl. 423-213.500.

Klinger, Karl-Heinz, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Hydroxyphenyl hydroxyethylaminoalkyl theophyllines. 3,855,221, Cl. 260-256.000.

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Kaminsky, Daniel; Klutchko, Sylvester; and Von Strandtmann, Maximilian, 3,855,216.

Knaus, Dennis A.; and Wysocky, Richard E., to Schlitz, Jos., Brewing Company. Perpetual calendar. 3,854,230, Cl. 40-107.000.

Kniese, Wilhelm; Plueckhan, Juergen; Kummer, Rudolf; Nienburg, Hans Juergen; and Tavs, Peter, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Method of continuously producing cobalt carbonyl hydride. 3,855,396, Cl. 423-417.000.

Knight Engineering & Molding Co.: *See*—
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Knight, James T.; and Green Glen R., to Ore-Ida Foods, Inc. Apparatus for producing prepared hash brown potato product. 3,854,393, Cl. 99-443.00c.

Knights, Richard Northan, to Imperial Metal Industries (Kynoch) Limited. Clamping and transfer device for elongate articles. 3,854,645, Cl. 226-162.000.

Knoche, Hubert, to Entreprise de Recherches et d'Activites Petrolieres Elf. Method of dismutation of olefins, catalyst employed and products obtained. 3,855,340, Cl. 260-683.00d.

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Kobayashi, Akio; Yamada, Tadao; Kawakami, Masuo; Ishioka, Hitoshi; and Nishiura, Hideyuki, to Ishikawajima-Horima Jukogyo Kabushiki Kaisha. Method for constructing an underground storage tank. 3,854,265, Cl. 52-742.090.

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Kobayashi, Hiroyuki, to Matsushita Electric Industrial Company Limited. Apparatus for deposition of semiconductor thin layers. 3,854,447, Cl. 118-421.000.

Kobayashi, Tadaaki: *See*—
Nemoto, Tadashi; Watanabe, Kiyoshi; Kobayashi, Tadaaki; Ishihara, Joo; Ono, Kenji; and Sonomoto, Kazuhiko, 3,855,015.

Kobayashi, Takashi: *See*—
Takahashi, Makoto; Shioya, Tsunetoshi; Kobayashi, Takashi; Fujii, Tatsuji; and Nishimura, Masakuni, 3,855,300.

Koch, Christian, to Siemens Aktiengesellschaft. Liquid vaporizer. 3,855,372, Cl. 261-131.000.

Koelle, Alfred R., to United States of America, Atomic Energy Commission. Fiber optic security seal. 3,854,792, Cl. 350-96.00b.

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Kohda, Yasuhiko, to Fujitsu Limited. Document feed mechanism. 3,854,713, Cl. 271-3.100.

Kohling, Alfons: *See*—
Binder, Horst; Kohling, Alfons; and Kuhn, Wolfgang, 3,854,994.

Kohls, Richard S. Article carrier for recreational vehicles. 3,854,641, Cl. 224-29.00r.

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Kolb, Robert H.: *See*—
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Kolchev, Cirilo. System for moving furniture. 3,854,544, Cl. 180-14.00e.

Kolesnichenko, Leonid Georgievich: *See*—
Kotova, Valentina Georgievna; Akopian, Gretel Artashesovna; Galitsky, Anatoly Ivanovich; Golin, Jury Petrovich; Snezhko, Valery Grigorievich; Kolesnichenko, Leonid Georgievich; Ivanenko, Larisa Akimovna; and Nekrasov, Jury Fedorovich, 3,855,446.

Konan Camera Research Institute: *See*—
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Kondo, Kiyosi; Matsumoto, Masakatsu; and Hatsutani, Miyako, to Sagami Chemical Research Center. Aklyl-substituted 3,6-dihydro-o-dioxin derivatives and process for their preparation. 3,855,246, Cl. 260-340.600.

Kondo, Takasi. Head light arrangement for a vehicle. 3,855,462, Cl. 240-8.240.

Konno, Minoru; and Ichiki, Mitsuo, to Copyer Co., Ltd. Assembly adapted to be assembled from two separate driving bodies. 3,854,344, Cl. 74-216.500.

Konrad, Charles Edward, to General Electric Company. Braking-mode detection circuit. 3,855,512, Cl. 317-366.000.

Konstant, Anthony N., to Speedrack Inc. Cantilever rack. 3,854,686, Cl. 248-243.000.

Koorneef, Jacob; Potgiesser, Jan Antoon Ludolf; and Walraven, Anthonie, to U.S. Philips Corporation. Magnetic head having variable gap length. 3,855,618, Cl. 360-69.000.

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Koppelman, Edward, to Continental Energy Corporation, mesne. Carbonization apparatus having louvers on internal duct. 3,855,071, Cl. 202-121.000.
Kornis, Gabriel; and Nidy, Eldon G., to Upjohn Company, The. Multistep process for preparing 1-(substituted-hydrocarbyl)-3,4,5-tribromopyrazoles. 3,855,236, Cl. 260-310.00r.
Kornylak, Andrew T., to Kornylak Corporation. Vertical conveyor shelf tilting mechanism. 3,854,570, Cl. 198-158.000.
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Korpeinen, Vaino. Forging machine. 3,854,318, Cl. 72-465.000.
Korshalla, Joseph Daniel: *See*—
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Kosaka, Tetsuji, to Mitsui Mining & Smelting Co., Ltd. Process for removing cluster adhering to cathode during electrolysis of manganous sulfate. 3,855,088, Cl. 204-96.000.
Kosonocky, Stephan, to United States of America, Army. Projectile fuze with flexible baffle. 3,854,402, Cl. 102-73.00r.
Kotova, Valentina Georgievna; Akopian, Gretel Artashesovna; Galitsky, Anatoly Ivanovich; Golin, Jury Petrovich; Snezhko, Valery Grigorievich; Kolesnichenko, Leonid Georgievich; Ivanenko, Larisa Akimovna; and Nekrasov, Jury Fedorovich. Device for directing he movement of welding electrode along the butt of joining parts. 3,855,446, Cl. 219-125.0pl.
Kovacevic, Krunoslav: *See*—
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Kozawa, Tokinori: *See*—
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Krainhofer, Gunter, to U.S. Philips Corporation. Loudspeaker fixture. 3,855,429, Cl. 179-146.00r.
Kral, Fred; and Powers, Robert L., Jr., to Bell & Howell Company. Magnetic card readout machine and cards therefor. 3,855,619, Cl. 360-73.000.
Kramer, Gerald J.: *See*—
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Krase, Horst: *See*—
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Kratel, Gunther: *See*—
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Krause, Gerhard. Automatic exposure apparatus for cameras. 3,855,604, Cl. 354-60.000.
Krause, Peter: *See*—
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Krause, Robert, KG: *See*—
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Krauss Maffei Aktiengesellschaft: *See*—
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Krauss-Maffie Aktiengesellschaft: *See*—
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Krechmar, Joseph. Pill container-dispenser. 3,854,626, Cl. 221-264.000.
Kreithen, Marvin L.; and Lawler, John J., to Textron Inc. Apparatus and means for performing a method for controlled deep hole drilling. 3,854,837, Cl. 408-17.000.
Kressel, Henry; Lockwood, Harry Francis; and Hawrylo, Frank Zygmunt, to RCA Corporation. Semiconductor injection laser with reduced divergence of emitted beam. 3,855,607, Cl. 357-18.000.
Krivec, Bert: *See*—
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Kromanaker, Dennis P. Tire protector. 3,854,448, Cl. 118-505.000.
Kron, Martin W., to Eastman Kodak Company. Apparatus for removing an imperfect portion of a web. 3,854,357, Cl. 83-105.000.
Krowicki, Krzysztof; and Zamojski, Aleksander, to Polska Akademia Nauk. Process for preparing 8-hydroxyerthromycin A and intermediates therefor. 3,855,200, Cl. 260-210.00e.
Krueger, Harvey R., to Reynolds Products, Inc. Hydromagnetic water control for automatic coffee brewer. 3,854,390, Cl. 99-307.000.
Kruse, Erwin, to Peddinghaus, Werner. Profile steel cutter. 3,854,358, Cl. 83-198.000.
Kucharzyk, Werner, to Bergwerksverband GmbH. Emission prevention in coking ovens. 3,855,073, Cl. 202-262.000.
Kudo, Takeshi: *See*—
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Kudo, Tutomu: *See*—
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Kuebler, Ervin L. Dispensing apparatus. 3,854,625, Cl. 221-198.000.
Kuhn, Eberhard, to Demag Baumaschinen Gesellschaft mit beschrankter Haftung. Mobile crane. 3,854,595, Cl. 212-145.000.
Kuhn, Rainer: *See*—
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Kuhn, Wolfgang: *See*—
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Kunisch, Alfred, to Francotyp GmbH. Franking machine with a letter feeding and a tape feeding device. 3,855,041, Cl. 156-442.200.
Kupferschmidt, Wolfgang; and Lison, Dietrich, to Wagner, Gunther, Firma. Magazine for a typewriter ribbon spool. 3,854,565, Cl. 197-151.000.
Kuroda, Minoru, 1/2 to Nishizawa Shoji Co. Ltd. and 1/2 to Dimension Weld International Corporation, The. Beaded article. 3,855,043, Cl. 161-5.000.
Kurz, Kieter; Bauer, Johann; Balwe, Thomas; Fendel, Kurt; and Sabel, Alex, to Wacker-Chemie GmbH. Process for suspension polymerization of vinyl chloride with low polymer deposition. 3,855,190, Cl. 260-87.100.
La Chall, Reuben A.: *See*—
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La Rose, Jasper Samuel. Sheet covering means for hair coloring, permanent waving, and hair conditioning. 3,854,148, Cl. 4-159.000.
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Laboratories Cassenne: *See*—
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Van Essen, Hendrik Arie; Slob, Arie; and Lagerberg, Johannes Paulus Lambertus, 3,855,484.
Laing, Nikolaus. Device for preventing back-flow in centrifugal pumps operating in parallel. 3,854,848, Cl. 417-424.000.
Lake, Ralph Jones, Jr.: *See*—
Balzer, Daniel Lee; and Lake, Ralph Jones, Jr., 3,854,905.
Lamberet, Paul. Conveying system with water-way. 3,854,415, Cl. 104-173.000.
Lamothe, Surguies M. Anchor bolt protective cap. 3,854,371, Cl. 85-1.00r.
Lampert, Sydney: *See*—
Rosenberg, David, 3,854,497.
Land, Edwin H., to Polaroid Corporation. Photographic apparatus for providing automatic cassette operation. 3,854,803, Cl. 352-72.000.
Landahl, Carl D.: *See*—
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Landig, Thomas W. Method of making an intricate free-form cast metal art object. 3,854,195, Cl. 29-527.500.
Landis, Earle: *See*—
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Lane, James Murray, III; and Lingenfelter, Guy E. Crop gathering belt. 3,854,272, Cl. 56-98.000.
Lane, Joseph J., to Arctic Enterprises Inc. Lawn mower handle mounting device. 3,854,834, Cl. 403-386.000.
Langer, Helmut; and Sollima, Vincent, to Machlett Laboratories, Incorporated, The. Vibration reduced X-ray anode. 3,855,492, Cl. 313-60.000.
Langguth, Robert P., to Monsanto Company. Machine dishwashing formulations containing a metal tetracarboxylate. 3,855,139, Cl. 252-99.000.
Langweiler, Frank, to Siemens Aktiengesellschaft. Measuring arrangement for determining the air-gap flux of a rotating-field machine. 3,855,529, Cl. 324-158.0mg.
Lania, Anthony R.; Chase, Edward L.; Chase, Francis M.; Graham, Leonard P.; and Murray, James E., to Chase Corporation. Thermal barrier tape. 3,855,051, Cl. 161-165.000.
Lannert, James W.: *See*—
Abrahamson, Dean W.; and Lannert, James W., 3,854,772.
Lannert, Kent P.; and Harken, Russel D., to Monsanto Company. Dioxolane polycarboxylates. 3,855,248, Cl. 260-340.900.
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Lapidot, Heine, to General Electric Company. Process and apparatus for the purification of an aqueous waste stream from a silicone-polymer producing plant. 3,855,124, Cl. 210-44.000.
Larry, John Robert, to Du Pont de Nemours, E. I., and Company. Metallizations comprising nickel oxide. 3,854,957, Cl. 106-1.000.
Larson, Donald J. Method of fabricating structures. 3,855,028, Cl. 156-79.000.
Lau Products, Ltd.: *See*—
Terrel, Gordon R.; Hause, Robert T.; Hancox, Alex J.; and McCulley, Fredrick J., 3,854,912.
Laugherty, James R.: *See*—
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Le Cardonnel, Gerard Marcel: *See—*
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Leach, Bruce E.; and Motz, Kaye L., to Continental Oil Company. Purification of Ziegler alcohols. 3,855,320, Cl. 260-643.00f.

Leben Utility Co., Ltd.: *See—*
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Leblanc, John R.: *See—*
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Lechene, Bernard Louis, to Glory Impression Cartonnage. Arrangement of panels for constituting display units and similar. 3,854,259, Cl. 52-293.000.

Leclert, Jean: *See—*
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Lee, Raymond, Organization, Inc., The: *See—*
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Lee, Robert E., to Lincoln Manufacturing Company, Inc. Food heating and warming cabinet. 3,855,451, Cl. 219-400.000.

Lefevre, James F., to Gates Rubber Company, The. Noise attenuating bradier carrier. 3,854,375, Cl. 87-55.000.

Leggett & Platt Incorporated: *See—*
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Leidich, Arthur John, to RCA Corporation. Push-pull transistor amplifier with driver circuits providing over-current protection. 3,855,540, Cl. 330-14.000.

Leidich, Arthur John, to RCA Corporation. Current proportioning circuit. 3,855,541, Cl. 330-22.000.

Leimgruber, Willy: *See—*
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Leiser, Manfred: *See—*
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Lemelson, Jerome H. Toy boat. 3,854,238, Cl. 46-93.000.

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Lenseigne, Jean Paul, to Societe Anonyme Petrole Service. Magnetic position detectors, notably level detectors. 3,855,559, Cl. 335-207.000.

Leonard, Lynn B.; and Petersen, Arne J., to Beckman Instruments, Inc. Electrochemical electrode assembly and method of making same. 3,855,095, Cl. 204-195.00g.

Lerouge, Claude Paul Henri: *See—*
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Lesh, Robert M.; and Woodberry, Eugene T., Jr. Method and apparatus for sealing the interface of zones having different environmental conditions with an opening in the interface for passing material between the zones. 3,854,222, Cl. 34-15.000.

Lesher, George Y.: *See—*
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Leuschner, Horst; and Viereck, Gerhard Gerhard, to Texas Instruments, Incorporated. Ultrasonic remote control receiver. 3,855,575, Cl. 340-16.70r.

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Lewin, Nathan: *See—*
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Lewis, Douglas R., to Ethylene Corporation. Flexible expansion joint having means for limiting lateral movement. 3,854,758, Cl. 285-114.000.

Leyarovski, Evgueni Iliev; Nicolov, Borislav Vassilev; and Gueorguiev, Yordan Krestev, to Physicheski Institute s Aneb pri Ban. Recovery of neon and helium from air by adsorption and closed cycle helium refrigeration. 3,854,913, Cl. 62-12.000.

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Muller, Gerhard; and Bondiek, Rolf, 3,855,554.
Schoberl, Werner, 3,855,606.

Lichtenberg, Alfred, to Siemens Aktiengesellschaft. Mechanically settable switch for a magnetic suspension railroad. 3,854,411, Cl. 104-148.0ms.

Lieberman, Norman P., to Standard Oil Company. Apparatus for interbed mixing of a fluid quench medium and a vapor-liquid mixture. 3,855,068, Cl. 196-155.000.

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Mold, James D.; Kallianos, Andrew G.; Means, Richard E.; and Simpson, Melvyn I., 3,854,485.

Lighthall, John T.; and Toy, Harry A., to GTE Automatic Electric (Canada) Ltd. Memory system including addressing arrangement. 3,855,580, Cl. 340-173.00r.

Lilly, Eli, and Company: *See—*
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Lim, Mahn-Jick, to Western Electric Company, Incorporated. Method of vapor-phase polishing a surface of a semiconductor. 3,855,024, Cl. 156-17.000.

Limpach, Paul D., to Gendron-Diemer, Inc. Swing-away footrest for invalid wheelchairs. 3,854,774, Cl. 297-429.000.

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Lin, Ping-Wha. Process for treating industrial wastewater. 3,855,125, Cl. 210-46.000.

Lincoln, Lewis L.; and Heseltine, Donald W., to Eastman Kodak Company. Dyestuffs and spectral sensitizers for silver halide. 3,854,956, Cl. 96-131.000.

Lincoln Manufacturing Company, Inc.: *See—*
Lee, Robert E., 3,855,451.

Lindenbaum, Bernard. Kite arrangement and method of construction. 3,854,682, Cl. 244-154.000.

Lindop, Roy: *See—*
Nelson, Tom Worsley; Sedgwick, Gordon; and Lindop, Roy, 3,854,503.

Lindow, Gerald L. Tree stand and seat. 3,854,551, Cl. 182-187.000.

Lindsay, Arwin O.; and Boalen, Kenneth C. Work support shoes for centerless grinding machines. 3,854,252, Cl. 51-238.0gg.

Lindsay, Harry Lee: *See—*
Dusza, John Paul; Lindsay, Harry Lee; and Bernstein, Seymour, 3,855,276.

Lingenfelter, Guy E.: *See—*
Lane, James Murray, III; and Lingenfelter, Guy E., 3,854,272.

Linstedt, Hans: *See—*
Steinberg, Diedrich; Johnke, Winfried; Roth, Helmut; Ruf, Walter; Steinbrenner, Ulrich; and Linstedt, Hans, 3,854,466.

Lison, Dietrich: *See—*
Kupferschmidt, Wolfgang; and Lison, Dietrich, 3,854,565.

List, William G. Truss carrier. 3,854,615, Cl. 214-501.000.

Liu, Philip J. P., to Aqua-Chem, Inc. Multi-stage flash evaporator. 3,855,072, Cl. 202-173.000.

Lloyd, Mary Kate: *See—*
Conley, Robert F.; Catherwood, Billy Reid; and Lloyd, Mary Kate, 3,854,971.

Lloyd, William W.; and Dexter, Richard J., to Texas Instruments, Incorporated. Ion-implantation and conventional epitaxy to produce dielectrically isolated silicon layers. 3,855,009, Cl. 148-1.500.

Lobel, Morris. Sealing structure. 3,854,257, Cl. 52-173.000.

Locher, Otto; Haag, Franz; and Bongartz, Paul, to Heimo Gerattbau Gesellschaft mit beschrankter Haftung. Spraying and smoke-la-ing apparatus. 3,855,148, Cl. 252-359.0cg.

Lock, Everett H.: *See—*
Maurer, Willam C.; and Lock, Everett H., 3,854,735.

Lockheed Aircraft Corporation: *See—*
Smethers, Rollo G., Jr., 3,854,679.

Lockwood, Harry Francis: *See—*
Kressel, Henry; Lockwood, Harry Francis; and Hawrylo, Frank Zygmunt, 3,855,607.

Loctite Corporation: *See—*
Maloesky, Bernard M., 3,855,040.

Loewe-Opta GmbH: *See—*
Ruff, Claus Werner, 3,855,141.

Logabax S.A.: *See—*
Flaceliere, Bernard Henri Gabriel; and Talvard, Jean-Pierre, 3,854,564.

LogEtronics Inc.: *See—*
McIntosh, Walter L., 3,854,815.

Lohmann & Stolterfoht Aktiengesellschaft: *See—*
Michling, Wilhelm, 3,854,349.

Lohr, Delmar F., Jr.; and Beckman, Joseph A., to Firestone Tire & Rubber Company, The. Stabilized polybutadiene compositions. 3,855,164, Cl. 260-23.70r.

Loiten, Kjell Olav: *See—*
Folkestad, Finn Enok; Loiten, Kjell Olav; Mejdell, Glor Thorvald; and Torvund, Asbjorn, 3,855,392.

Loliger, Willi; and Schmied, Rudolf, to Alpura Koreco A.G. Apparatus for controlling the atmosphere of the sterile chamber in an aseptic packaging machine. 3,854,874, Cl. 21-91.000.

Lone Star Gas Company: *See—*
Goldsberry, Fred L., 3,854,663.

Longworth, Arthur Raymond: *See—*
Billany, Michael Royston; Longworth, Arthur Raymond; and Shatwell, John, 3,855,140.

Lorain Products Corporation: *See—*
Brown, Harold J., 3,855,528.

Loth, Richard Bert. Toy building block. 3,854,237, Cl. 46-26.000.

Loveless, Frederick C.; and Miller, Don H., to Uniroyal, Inc. Hydrogenation catalyst. 3,855,185, Cl. 260-80.780.

Lovell, Lyle M.; Johnston, Walker F.; and Kramer, Gerald J., to Standard Oil Company. Apparatus for loading solid particles into a vertical vessel. 3,854,637, Cl. 222-564.000.

Lovell, Walter: *See*—
Grise, Frederick G. J.; and Lovell, Walter, 3,854,770.

Loven, Andrew W.: *See*—
Strudgeon, George E.; and Loven, Andrew W., 3,855,123.

Lovering, David W.: *See*—
Brenneman, Richard S.; Lovering, David W.; and Barr, Frederick E., 3,854,975.

Loxham, John, to Cranfield Institute of Technology. Measuring and counting systems. 3,854,823, Cl. 356-169.000.

Loy, Fred W.: *See*—
Harms, William J.; and Loy, Fred W., 3,855,567.

Lubold, Harvey C., Jr.; and Roberts, Glenn H. Furnace assembly and method for heating workpieces. 3,854,863, Cl. 432-11.000.

Lucas Electrical Company Limited, The: *See*—
Allport, Maurice James, 3,855,517.

Lucas, Joseph, (Electrical) Limited: *See*—
Jukes, Norman Alfred, 3,854,461.

Lucas, Joseph, (Industries) Limited: *See*—
Nelson, Tom Worsley; Sedgwick, Gordon; and Lindop, Roy, 3,854,503.

Luce, John B., to General Electric Company. Flame retardant polymer composition. 3,855,356, Cl. 260-881.000.

Luebbe, Ray Henry, Jr., to Xerox Corporation. Manifold imaging method and member employing fundamental particles of alpha metal-free phthalocyanine. 3,854,943, Cl. 96-1.500.

Luke, John A., to Brown & Williamson Tobacco Corporation. Production of tobacco-smoke filters. 3,855,032, Cl. 156-199.000.

Lund, Robert E.: *See*—
Brockmiller, Charles Anthony; Lund, Robert E.; and Fitzsimmons, John Edward, 3,855,387.

Lupinski, John H.; and Barnes, Wilson J., to General Electric Company. Electrocoating compositions and method for making same. 3,855,169, Cl. 260-29.20n.

Lyons, James E., to Sun Ventures, Inc. Olefin isomerization catalysts and process. 3,855,323, Cl. 260-666.00a.

M&T Chemicals Inc.: *See*—
Chopdekar, Vilas M., 3,855,310.

Mac, R.W., Company: *See*—
MacDonnell, Robert W.; and Shander, Otto A., 3,854,417.

MacDermid Incorporated: *See*—
Mersereau, Mark; Rhodenizer, Harold L.; Grunwald, John J.; and Innes, William P., 3,854,973.

MacDonald, Robert Neal, to Du Pont de Nemours, E. I., and Company. 1,2,5-Thiadiazole polymers. 3,855,183, Cl. 260-78.30r.

MacDonnell, Robert W.; and Shander, Otto A., to Mac, R.W., Company. Automatic visual hand brake system. 3,854,417, Cl. 105-1.00a.

MacDonnell, Robert W., to Unity Railway Supply Co., Inc. Resilient journal box stop block. 3,854,782, Cl. 308-38.000.

Mach, Lumir: *See*—
Chvalovsky, Vaclav; Mach, Lumir; and Machova, Helena, 3,854,986.

Machek, John A., to Wagner Electric Corporation. Antilock brake system and control valve therefor. 3,854,501, Cl. 137-627.500.

Machihara, Akira: *See*—
Okabe, Jiro; Machihara, Akira; Kaneyasu, Mutsumi; and Kato, Kojiro, 3,854,995.

Machlett Laboratories, Incorporated, The: *See*—
Langer, Helmut; and Sollima, Vincent, 3,855,492.

Machova, Helena: *See*—
Chvalovsky, Vaclav; Mach, Lumir; and Machova, Helena, 3,854,986.

Mack Trucks, Inc.: *See*—
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Mackenhus Corporation: *See*—
McNeely, Arthur O.; Kennedy, Wiley T.; and Huska, Paul, 3,855,031.

Mackey, Leroy S., to United Starting Gate Corporation. Starting gate master switch and circuitry. 3,854,451, Cl. 119-15.500.

Mackie, James & Sons Limited: *See*—
Mackie, John K. P., 3,854,169.

Mackie, John K. P., to Mackie, James & Sons Limited. Means for mounting fallers in a textile gill box. 3,854,169, Cl. 19-127.000.

MacManus, John. Machine for producing aerated food products. 3,854,700, Cl. 259-4.000.

MacMaster, George H.; and Dudley, Kenneth W., to United States of America, Navy. Center-pole magnetic circuit. 3,855,498, Cl. 315-39.710.

Macy, Robert H.: *See*—
Broussard, Douglas E.; Hemphill, Dean P.; Kolb, Robert H.; and Macy, Robert H., 3,854,297.

Maddux, John F., to Owens-Corning Fiberglas Corporation. Current equalization means and method for unequally loaded cables in an electric glass melting furnace. 3,855,412, Cl. 13-6.000.

Maeda, Mitsuaki: *See*—
Takemura, Satoshi; Maeda, Mitsuaki; and Sakai, Noboru, 3,854,515.

Maeda, Yo; Asaoka, Masao; Okamura, Toshiro; Nagahama, Sigenori; Yamaguchi, Yutaka; Hoshi, Ikuo; Takaki, Kiyoshi; Masubuchi, Yorimitu; Iigaya, Haruo; and Nakano, Mineo, to Hitachi Chemical Company, Ltd. Process for producing synthetic pulp-like materials an producing synthetic papers therefrom. 3,855,056, Cl. 162-157.00r.

Maeda, Yoshihisa: *See*—
Nakajima, Tethuo; and Maeda, Yoshihisa, 3,855,127.

Maeda, Yutaka: *See*—
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Maeder, Arthur: *See*—
Nachbur, Hermann; and Maeder, Arthur, 3,855,309.

Maertens, Dieter; Witte, Josef; and Beck, Manfred, to Bayer Aktiengesellschaft. Trans-1,5-polypentenamer with improved processing properties. 3,855,361, Cl. 260-931.000.

Maerz Ofenbau AG: *See*—
Tschinkel, Friedrich, 3,854,635.

Magdo, Ingrid E.; and Magdo, Steven, to International Business Machines Corporation. Space charge limited transistor having recessed dielectric isolation. 3,855,609, Cl. 352-22.000.

Magdo, Steven: *See*—
Magdo, Ingrid E.; and Magdo, Steven, 3,855,609.

Maheswaran, S. K., to University of Minnesota, The Regents of the. Poultry vaccine. 3,855,408, Cl. 424-92.000.

Maier, Gerhard, to Maschinenfabrik B. Maier KG. Blade holder for steel strip blades. 3,854,511, Cl. 144-230.000.

Maiste, Arved, to White Motor Corporation of Canada Limited. Corn header with automatic tensioning of feeder chains. 3,854,572, Cl. 198-174.000.

Makovec, Donald J.: *See*—
Hutson, Thomas, Jr.; and Makovec, Donald J., 3,855,345.

Malagari, Frank A.: *See*—
Salsgiver, James A.; and Malagari, Frank A., 3,855,019.
Salsgiver, James A.; and Malagari, Frank A., 3,855,020.
Salsgiver, James A.; and Malagari, Frank A., 3,855,021.

Maloesky, Bernard M., to Loctite Corporation. Anaerobic compositions. 3,855,040, Cl. 156-310.000.

Manderscheid, Peter: *See*—
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Mandoki, Andor: *See*—
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Manhart, Gernot: *See*—
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Manhattan Industries, Inc.: *See*—
Duffy, Edward T., 3,854,147.

Manner, Roland; and Hueber, Peter, to Krause, Robert, KG. Actuating device. 3,854,785, Cl. 312-319.000.

Mannerblad, John: *See*—
Ohlund, Johan Alex Ingvar; Mannerblad, John; and Wallgard, Gunnar Alexius, 3,854,722.

Mannheim, Otto Waschka: *See*—
Becker, Lothar; Kahr, Kurt; Rapp, Guenther; and Mannheim, Otto Waschka, 3,855,080.

Manning, Don P.; and Flower, Thomas A., to Allied Chemical Corporation. Apparatus for controlled quenching of melt extruded filaments. 3,855,453, Cl. 219-553.000.

Manning, Eugene P., to Kamre Corporation. Bobbin holder for attachment of different sized bobbins to a spool. 3,854,673, Cl. 242-118.410.

Manufacturing Approaches & Total Concepts, Inc.: *See*—
Reed, James C., 3,854,360.

Marans, Nelson S.: *See*—
Kehr, Clifton Leroy; and Marans, Nelson S., 3,854,535.

Marathon Oil Company: *See*—
Duke, Roy B., Jr., 3,855,268.
Merrill, La Vaun S., Jr.; and Schilson, Robert E., 3,855,336.

Marecaux, Paul, to Societe Pour l'Equipment des Industries Chimiques Speichim. Process and device for purification of effluents containing phenols and ammonium salts. 3,855,076, Cl. 203-11.000.

Maresca, Gerard: *See*—
Eisen, Irving A.; and Maresca, Gerard, 3,855,454.

Marin, Heiner, to Siemens Aktiengesellschaft. Compressed-gas circuit breaker. 3,855,436, Cl. 200-148.00r.

Marker, Hannes: *See*—
Marker, Hannes; and Jungkind, Roland (said Jungkind assor. to said), 3,854,741.

Marker, Hannes; and Jungkind, Roland, said Jungkind assor. to said Marker, Hannes. Toe iron for safety ski bindings. 3,854,741, Cl. 280-11.35t.

Marley, James A., Jr.: *See*—
Polata, Bohumil; Marley, James A., Jr.; and Kerr, John T., 3,855,007.

Maroschak, Ernest J. Apparatus and method for fabricating corrugated plastic tubing. 3,854,527, Cl. 165-120.000.

Marsh, James Courtland, Jr., to RCA Corporation. Programming system for a motor-driven television receiver tuning apparatus. 3,855,535, Cl. 325-471.000.

Marteau, Jacques: *See*—
Pautrat, Rene; and Marteau, Jacques, 3,855,348.

Martin, Donald E., to Aurora Products Corporation. High performance model vehicle racetrack. 3,854,405, Cl. 104-60.000.

Martin, Larry D.: *See*—
Frost, Jack G.; Knox, John A.; and Martin, Larry D., 3,854,996.

Martin, Michael S. Screen printing and drying machine. 3,854,398, Cl. 101-41.000.

Martin, Paul Warren, to Dresser Industries, Inc. Step controlled tube expander. 3,854,314, Cl. 72-122.000.

Martin, Ralph, to Western Forge Corporation. Arc joint plier. 3,854,351, Cl. 81-414.000.

Martin, William Allen; and Chesley, Richard Carleton, to Eastman Kodak Company. Web feeding apparatus with guide arm. 3,854,677, Cl. 242-195.000.

Martinelli, Arnold C. Closure and container. 3,854,582, Cl. 206-508.000.

Marumo, Hideo. Detergent composition. 3,855,156, Cl. 252-547.000.

Marzoli, Angelo, to F. LLI Marzoli & C. S.p.A. False twister device. 3,854,276, Cl. 57-77.400.

Maschinenfabrik B. Maier KG: *See*—
Maier, Gerhard, 3,854,511.

Maschinenfabrik Buckau R. Wolf Aktiengesellschaft: *See*—
Pause, Kurt; Dregger, Ernst Ullrich; and Otten, Gottfried, 3,854,657.

Mashimo, Yukio: *See*—
Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 3,855,601.

Masopust, Otto T., Jr., to Western Electric Company, Incorporated. Method and system for determining the resistance of the dielectric in a capacitor. 3,855,527, Cl. 324-60.00c.

Massa Corporation, mesne: *See*—
Massa, Frank, 3,855,571.

Massa, Frank, to Massa Corporation, mesne. Aircraft ground traffic control system. 3,855,571, Cl. 340-26.000.

Massey, Lester G.: *See*—
Huebler, Jack; Massey, Lester G.; and Tarman, Paul B., 3,855,403.

Masson Scott Trissell Engineering, Ltd.: *See*—
Jones, Graham Robin Scott, 3,854,329.

Masubuchi, Yorimitu: *See*—
Maeda, Yo; Asaoka, Masao; Okamura, Toshiro; Nagahama, Sigenori; Yamaguchi, Yutaka; Hoshi, Ikuo; Takaki, Kiyoshi; Masubuchi, Yorimitu; Iigaya, Haruo; and Nakano, Mineo, 3,855,056.

Masuda, Fujio, to Sakura Refrigerating & Heating Engineering Co., Ltd. Defroster for a refrigerating system. 3,854,302, Cl. 62-282.000.

Masuda, Hiroo; Masuhara, Toshiaki; Nagata, Minoru; and Kozawa, Tokinori, to Hitachi, Ltd. Semiconductor device. 3,855,610, Cl. 357-23.000.

Masuhara, Kenichi: *See*—
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Masuhara, Toshiaki: *See*—
Masuda, Hiroo; Masuhara, Toshiaki; Nagata, Minoru; and Kozawa, Tokinori, 3,855,610.

Matier, William L.; and Comer, William T., to Mead Johnson & Company. 5-Aryl-1,2,4-thiadiazine 1,1-dioxides and 5,6-dihydro-aryl-1,2,4-thiadiazine 1,1-dioxides. 3,855,218, Cl. 260-243.00r.

Matlik, August, to Brundell och Jonsson AB. Tree felling device. 3,854,510, Cl. 144-34.00r.

Matson, Wayne R., to Environmental Sciences Associates, Inc. Electrode for anodic stripping voltammetry. 3,855,099, Cl. 204-195.00f.

Matsui, Kazumi; Umemori, Takashi; Toyoshima, Masahiko; Katakami, Kozo; and Osawa, Susumu, to Hitachi Cable Limited and Japanese National Railway. Ground coil assembly of a linear induction motor with D.C. levitating armature for high speed vehicle. 3,855,45, Cl. 310-13.000.

Matsukawa, Hidehiko; Ito, Haruo; and Suzuki, Taneko. Biologically active peptide and method of preparing the same. 3,855,196, Cl. 260-112.00r.

Matsukawa, Hiroharu: *See*—
Saeki, Keiso; and Matsukawa, Hiroharu, 3,855,146.

Matsumoto, Masakatsu: *See*—
Kondo, Kiyosi; Matsumoto, Masakatsu; and Hatsutani, Miyako, 3,855,246.

Matsuo, Kazumasa, to Olympus Optical Co., Ltd. Stilet for endoscopes. 3,854,473, Cl. 128-8.000.

Matsushita Electric Industrial Company Limited: *See*—
Kobayashi, Hiroyuki, 3,854,447.

Matsuwake, Yoshio; and Fujishima, Yukihisa, to Alps Electric Co., Ltd. Method of producing variable capacitors. 3,854,181, Cl. 29-25.410.

Matuck, George C.: *See*—
Cowardin, Robert L.; Matuck, George C.; McCray, Charles M.; Powell, Flavius M.; Pratt, Woodrow W.; Thomas, Delbert C., Jr.; and Thorne, William D., 3,854,563.

Matulis, Juozas Juozovich: *See*—
Sharmaitis, Romas Romovich; Vilutene, Valentina Alexeevna; and Matulis, Juozas Juozovich, 3,855,010.

Matumoto, Mituaki; and Aono, Tadayoshi, to Nippon Steel Corporation. Process for purifying a gas containing hydrogen cyanide. 3,855,390, Cl. 423-236.000.

Maurer, Willam C.; and Lock, Everett H., to Exxon Production Research Company. Static face seal. 3,854,735, Cl. 277-189.000.

Maurice, Francis Auguste: *See*—
Molins, Desmond Walter; and Maurice, Francis Auguste, 3,854,486.

Maurin, Jean: *See*—
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May, Erhard Thaddaus, to Olt, A., Firma. Reversing cam drum for quick traverse winder and traveller for said reversing cam drum. 3,854,343, Cl. 74-57.000.

Mayer & Cie. Maschinenfabrik: *See*—
Hamma, Gerhard, 3,854,304.

Mayer, Hans; Schroder, Heinz-Jurgen; and Schucktanz, Gerhard, to Siemens Aktiengesellschaft. Steam generator. 3,854,453, Cl. 122-32.000.

Mazel, Carlman. Key for master chain link. 3,854,282, Cl. 57-7.000.

McAllister, Owen E., to Combustion Engineering, Inc. Threshold weatherstrip. 3,854,246, Cl. 49-470.000.

McCarty, John O.; and Smith, Leary W., to Audichron Company, The. Transducer head mounting apparatus. 3,855,626, Cl. 360-104.000.

McCloskey, James W.: *See*—
Paolieri, Roberto; Pitts, Todd A.; and McCloskey, James W., 3,855,400.

McClure, Glenn T.; and Mong, William K., to Westinghouse Air Brake Company. Automatic hose connector for railway cars. 3,854,597, Cl. 213-76.000.

McConnell, Robert B., to Ashland Oil, Inc. Quaternary ammonium derivatives of bisimidazoline compounds. 3,855,235, Cl. 260-309.600.

McConnell, Ronald F.: *See*—
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McCray, Charles M.: *See*—
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McCulley, Fredrick J.: *See*—
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McCulloch Corporation: *See*—
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McCutchen, Hugh L.; and Cardwell, Paul H., to Deepsea Ventures, Inc. Process for the electrolytic refining of heavy metals. 3,855,089, Cl. 204-105.00m.

McDole, Ewell E.; and Howard, Frank L., to Kaiser Aluminum & Chemical Corporation. Dispersion for hot rolling aluminum products. 3,855,136, Cl. 252-49.500.

McDonnell Douglas Corporation: *See*—
Boehringer, Wilfred E.; and Walker, James V., 3,854,780.

McGee, Weldon L. Ski vise. 3,854,712, Cl. 269-43.000.

McGeogh, James E.: *See*—
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McGraw-Edison Company: *See*—
Sidell, Philip A., 3,855,490.

McInnes, Robert. Cleaning and plating apparatus. 3,855,107, Cl. 204-201.000.

McIntosh, Walter L., to LogEtronics Inc. Graphic arts camera flashing attachments. 3,854,815, Cl. 355-67.000.

McKinney, C. Daniel; and Vickery, Forrest C., to Owens-Corning Fiberglas Corporation. Method of and apparatus for processing flexible sheet material. 3,854,917, Cl. 65-3.000.

McKinstry, Richard G., to Anchor Hocking Corporation. Method for continuous heat treating of glass articles. 3,854,918, Cl. 65-30.000.

McKirnan, Robert A., to Knight Engineering & Molding Co. Child-proof cover. 3,854,622, Cl. 220-306.000.

McLaren, Theron D.; Sawdy, Jack T.; and 432381, to Petrolite Corporation. Electrical treater system for producing a combustible fuel. 3,855,103, Cl. 204-306.000.

McLean, Ronald L.; and Bartula, Richard J., to Acme Highway Products Corporation. Composite expansion joint assembly. 3,854,159, Cl. 14-16.000.

McLoughlin, Robert W.; and Muttall, Colin P., to Gallaher Limited. Optical inspection apparatus. 3,854,587, Cl. 209-111.700.

McMaster, Clarence O., to Minnesota Mining and Manufacturing Company. Film cartridge. 3,854,804, Cl. 352-78.00r.

McNeely, Arthur O.; Kennedy, Wiley T.; and Huska, Paul, to Mackenhus Corporation. Method and apparatus for laminating, impregnating and curing continuous tubes. 3,855,031, Cl. 156-190.000.

McOran-Campbell, Ivan Charles, to Turners Asbestos Products (Private) Limited. Coupling for pipe-like components. 3,854,757, Cl. 285-100.000.

McQueston, Herbert J.: *See*—
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Medem, Vulf Matveevich; Boldrev, Sergei Andreevich; Karpenko, Leonty Petrovich; Dolukhanov, Rafik Tsaturovich; and Sergeev, Nikolai Sergeevich. Method for separation of emulsion prepared in microbiological dewaxing of petroleum fractions having distillatio range from 230 59 450. 3,855,116, Cl. 208-188.000.

Medical Development Corporation: *See*—
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Meiji Seika Kaisha, Ltd.: *See*—
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Meiners Optical Devices Limited: *See*—
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Melloni, Piero; Metelli, Raffailla; Vecchiette, Vittorio; DeCarneri, Ivo; and Gisella, Monti, to Erba, Carlo, S.p.A. Tetrahydro-2-naphthyl ester derivatives of tinonocarbanilic acids. 3,855,263, Cl. 260-455.00a.
Mellor, Roger: *See*—
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Mendelsohn, Jean Claude; and Blanc, Jean Henri, to Societe Nationale des Petroles d'Aquitaine. Production of styrene. 3,855,330, Cl. 260-669.00r.
Mendoza, Fausto Celorio. Oven arrangement. 3,854,864, Cl. 432-130.000.
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Mentrup, Anton: *See*—
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Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Randau, Dieter; and Schnell, Wolfram, 3,855,130.
Mercurio, Leonard. Pick resistant lock having laterally movable wafers. 3,854,311, Cl. 70-364.00r.
Merestechnikai Kozponti Kutato Laboratorium: *See*—
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Merkell, Karl Ake; and Carlen, Jan-Christer Henric Ovesson, to Sandvik Aktiebolag. Chain saw unit. 3,854,363, Cl. 83-834.000.
Merrigan, Joseph Andrew: *See*—
Gilman, Paul Brewster, Jr.; Raleigh, Ronald George; and Merrigan, Joseph Andrew, 3,854,949.
Merrill, La Vaun S., Jr.; and Schilson, Robert E., to Marathon Oil Company. Process for the production of synthesis gas, cracked hydrocarbon and calcined coal. 3,855,336, Cl. 260-679.00r.
Mersereau, Mark; Rhodenizer, Harold L.; Grunwald, John J.; and Innes, William P., to MacDermid Incorporated. Method of making additive printed circuit boards. 3,854,973, Cl. 117-47.00a.
Mertzweiller, Joseph K.; and Tenney, Horace M., to Exxon Research and Engineering Company. Hydrogenation of organic compounds. 3,855,324, Cl. 260-666.00p.
Merz, Josef; Van Esdonk, Johannes; and Janssen, Joannes Franciscus Maria, to U.S. Philips Corporation. Metal-to-ceramic leadthrough. 3,854,827, Cl. 403-29.000.
Messing, Bernd, to Hahn, Carl, Dr., K.C. Tampon having an insertion end of lesser density than the body portion. 3,854,481, Cl. 128-285.000.
Messner, Georg, to Oronzio de Nora Impianti Elettrochimici S.p.A. Process and apparatus for the electrolysis of HC containing solutions with graphite electrodes which keep the chlorine and hydrogen gases separate. 3,855,104, Cl. 204-129.000.
Mestetsky, Thomas S., to GAF Corporation. Adhesive tape coated with a controlled release coating composition. 3,855,052, Cl. 161-167.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Muller, Wolf-Dieter, 3,854,895.
Metcalf, Robert L.; Kapoor, Inder; and Hirwe, Asha, to Univeristy of Illinois Foundation. Insecticidal biodegradable methylthio analogs of DDT. 3,855,313, Cl. 260-609.00e.
Metelli, Raffailla: *See*—
Melloni, Piero; Metelli, Raffailla; Vecchiette, Vittorio; DeCarneri, Ivo; and Gisella, Monti, 3,855,263.
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Stoepel, Kurt; and Bayer Aktiengesellschaft. 2,6-Diamino-1,4-dihydropyridine derivatives. 3,855,231, Cl. 260-294.80g.
Mezoff, John G., to American Magnesium Company. Method for inoculating molten metal with an inoculating material. 3,854,939, Cl. 75-130.00b.
Michael, David H.; deceased (by Michael, Margaret C.; legal representative). Coated structural units having improved physical properties. 3,854,987, Cl. 117-123.00a.
Michael, Margaret C.: *See*—
Michael, David H., 3,854,987.
Michling, Wilhelm, to Lohmann & Stolterfoht Aktiengesellschaft. Multi-stage speed reducer with resilient shaft supports. 3,854,349, Cl. 74-801.000.
Micmo S.A.: *See*—
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Mid-American Body & Equipment Co. Inc.: *See*—
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Mikolajczyk, Raymond F. Well sample washer. 3,855,118, Cl. 209-270.000.
Milam, Thomas B.: *See*—
Sciacca, Angelo J.; and Milam, Thomas B., 3,854,799.
Miles Laboratories, Inc.: *See*—
Boyer, Robert Allan; and Chen, Anthony Hing, 3,854,870.
Miller, Calvin L., to Caterpillar Tractor Company. Lubrication system for swing gear drive. 3,854,553, Cl. 184-6.120.
Miller, Charles Fredrick. Method and apparatus for bonding in miniaturized electrical circuits. 3,855,034, Cl. 156-297.000.
Miller, Don H.: *See*—
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Miller Engineering Corporation: *See*—
Miller, Frank H., Jr.; and Witherspoon, David L., 3,854,601.
Miller, Frank H., Jr.; and Witherspoon, David L., to Miller Engineering Corporation. Apparatus for forming patterned layers. 3,854,601, Cl. 214-6.00p.
Miller, Harold L.: *See*—
Cameron, Frank L.; and Miller, Harold L., 3,855,563.
Miller, Lucian C.: *See*—
Judkins, Herbert T.; and Miller, Lucian C., 3,854,717.
Miller, Richard Montgomery. Traffic network system. 3,854,408, Cl. 104-124.000.
Millipore Corporation: *See*—
Rising, Donald B., 3,854,907.
Milton, George A.; and Russell, Ian M. Corner locks for concrete forms. 3,854,692, Cl. 249-194.000.
Minnesota Mining and Manufacturing Company: *See*—
Groff, Gaylord L., 3,855,047.
McMaster, Clarence O., 3,854,804.
Versorese, Walfredo, 3,854,948.
Minnick, Leonard John; Webster, William C.; and Smith, Charles L., to IU Conversion Systems, Inc. Lime-fly ash cementitious mixture with improved hardening and expansion characteristics. 3,854,968, Cl. 106-109.000.
Mirtain, Henri J., to Uniroyal. Segmental mold. 3,854,853, Cl. 425-47.000.
Mischke, Robert, 1/2 to Bellisle, Richard. Sun canopy convertible to a swimming pool cover. 3,854,149, Cl. 4-172.110.
Mitchell, Maurice M., Jr., to Atlantic Richfield Company. Catalyst for conversion of non-cyclic C_3-C_5 alkanes to aromatic hydrocarbons. 3,855,154, Cl. 252-456.000.
Mitsubishi Bayon, Ltd.: *See*—
Ozeki, Takao; Ito, Kazuo; Maeda, Yutaka; and Kudo, Takeshi, 3,855,168.
Mitsubishi Pencil Co., Ltd.: *See*—
Kamo, Mitsunori, 3,854,824.
Mitsubishi Rayon Company, Ltd.: *See*—
Ono, Kazuo; Tsuchiya, Tadao; Kawamoto, Akio; and Nakada, Jun, 3,855,376.
Mitsui Mining & Smelting Co., Ltd.: *See*—
Kosaka, Tetsuji, 3,855,088.
Mittendorf, Jean H. Self-adjusting stock centralizer. 3,854,647, Cl. 226-198.000.
Miyanaga, Masaaki. Core drill. 3,854,840, Cl. 408-204.000.
Mobil Corporation: *See*—
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Huang, Tracy J.; and Yurchak, Sergei, 3,855,343.
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Moedritzer, Kurt, to Monsanto Company. Phosphorus-containing polymers. 3,855,186, Cl. 260-80.0ps.
Moedritzer, Kurt, to Monsanto Company. Phosphorus-containing polymers. 3,855,352, Cl. 260-873.000.
Moen, Lenard E. Automatic dispenser for hot fluids under pressure. 3,854,631, Cl. 222-146.0he.
Mohacsi, Ernest: *See*—
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Mold, James D.; Kallianos, Andrew G.; Means, Richard E.; and Simpson, Melvyn L., to Liggett & Myers Incorporated. Tobacco compositions comprising mono-esters of mono-and dialkylmalonates. 3,854,485, Cl. 131-17.00r.
Molina, Orlando G., to Rockwell International Corporation. Method of magnetic particle testing using strippable coatings. 3,855,526, Cl. 324-38.000.
Molins, Desmond W.; Labbe, Francis A. M.; Preston, Edward G.; and Jackson, Norman W., to Molins Limited. Manufacture of filter tipped cigarettes. 3,854,487, Cl. 131-61.00a.
Molins, Desmond Walter; and Maurice, Francis Auguste, to Molins Limited. Cigarette making machines. 3,854,486, Cl. 131-61.00a.
Molins Limited: *See*—
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Moll, Franz: *See*—
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Molybdenum Corporation of America: *See*—
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Monarch Marking Systems, Inc.: *See*—
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Monne, Maxime. Motorized suspended trolley. 3,854,406, Cl. 104-94.000.
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Monsanto Company: *See*—
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Montagnon, Paul A. F., to Analytab Products Inc. Analysis vessel enclosing an anchored ring of solid reagent. 3,854,883, Cl. 23-253.00r.

Montoya, Jonas. Tassel and pompom making apparatus. 3,854,179, Cl. 28-2.000.

Moore, Arthur H.: *See—*
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Moore, Arvel H. Support bracket. 3,854,684, Cl. 248-68.00r.

Moore Business Forms, Inc.: *See—*
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Moore, John David, to International Synthetic Rubber Company Limited, The. Process for preparing graft copolymers in aqueous emulsion. 3,855,355, Cl. 260-880.00r.

Moore, Raymond H., to Battelle Memorial Institute. Catalytic fused salt extraction process for removal of sulfur oxides from flue or other gases. 3,855,386, Cl. 423-210.500.

Moore, Richard E. Pressure polished extruded polycarbonate or polysulfone sheet. 3,855,042, Cl. 161-1.000.

Moore, William G.: *See—*
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Moran, Paul R.; and Podgorsak, Ervin B., to United States of America, Atomic Energy Commission. Charge storage device. 3,854,337, Cl. 73-362.00r.

Mordre, Sigurd C., to Ederer Incorporated. Variable capacity crane hoist. 3,854,592, Cl. 212-11.000.

Morgan Adhesives Company: *See—*
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Morgan, Burton D., to Morgan Adhesives Company. Laminated label or similar article. 3,854,229, Cl. 40-2.000.

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Morinaga Milk Industry Co., Ltd.: *See—*
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Morrison, Robert S.; and Hesse, Jack E., to Johns-Manville Corporation. Multi-layered plastic pipe. 3,854,504, Cl. 138-141.000.

Morrison, Roger A., to Mobil Oil Corporation. Aromatization process using zinc and rhenium modified ZSM-5 catalyst. 3,855,115, Cl. 208-135.000.

Morrow, Hugh, III; and Sponseller, David L., to American Metal Climax, Inc. High temperature alloy. 3,854,941, Cl. 75-171.000.

Morrow, William B.; and Anders, Gary H., to Aqua Mist, Incorporated. Humidifying apparatus for warm air ducts and the like. 3,855,371, Cl. 261-100.000.

MOS Technology, Inc.: *See—*
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Mosher, Charles L., to Owatonna Tool Company. Disc brake tool. 3,854,216, Cl. 33-181.0at.

Mosier, John E.: *See—*
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Mosler, Henry A.; and Weber, Richard, to Esso Research and Engineering Company. Plural temperature controls of distillation. 3,855,074, Cl. 203-2.000.

Moss, James H., Jr.; Daniels, Calvin L.; and Forward, Cleve H., to Cosden Oil & Chemical Company. Vinyl xylenes and method. 3,855,331, Cl. 260-669.00r.

Moss, Philip Hotchkiss: *See—*
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Mosstype Corporation: *See—*
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Motorola, Inc.: *See—*
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George, William Lloyd; Hays, Robert Guy; and Rhee, Chonokook John, 3,855,608.
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Mott, James D., to Hydril Company. Method and apparatus for an equalizing valve. 3,854,502, Cl. 137-629.000.

Motter, James W.; and Allen, Connie A., to Toroid Corporation. Flow meter. 3,855,458, Cl. 235-151.340.

Motz, Kaye L.: *See—*
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Mueller, Pierre, to Bobst, J., & Fils, S.A. Method of guiding a thin flexable web strip which is at least partially metallic. 3,854,642, Cl. 226-3.000.

Mueller, Wolfgang H., to Exxon Research and Engineering Company. Sulfur containing heterocycles. 3,855,240, Cl. 260-327.00p.

Muller, Gerhard; and Bondiek, Rolf, to Licentia Patent-Verwaltungs-G.m.b.H. Oscillator circuit for testing inductors. 3,855,554, Cl. 331-167.000.

Muller, Jurgen: *See—*
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Muller, Richard, to Gebr. Hofmann KG. Process and device for balancing of rotors. 3,854,339, Cl. 73-462.000.

Muller, Wolf-Dieter, to Metallgesellschaft Aktiengesellschaft. Process for producing a methane-rich gas usable in place of natural gas. 3,854,895, Cl. 48-206.000.

Mundipharma AG: *See—*
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Musgrave, Daniel D. Clip holding guide. 3,854,232, Cl. 42-87.000.

Muta, Tohru; Abo, Hideo; and Noguchi, Sakae, to Nippon Steel Corporation. Pitting corrosion resistant austenite stainless steel. 3,854,937, Cl. 75-128.00n.

Mutschler, Gene E.: *See—*
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Muttall, Colin P.: *See—*
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Myers, Harold D.; and Moore, William G., to Dow Chemical Company, The. Cooling concentrated, diaphragm cell sodium hydroxide solutions. 3,854,299, Cl. 62-58.000.

Nabisco, Inc.: *See—*
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Nachbur, Hermann; and Maeder, Arthur, to Ciba-Geigy AG. Process for the manufacture of phosphorus-containing condensation products, the products and their use as flameproofing agents. 3,855,309, Cl. 260-606.50p.

Nachtigall, Guenter Willi, to American Cyanamid Company. Method of purification of acrylamide by distillation with a polymer inhibitor. 3,855,075, Cl. 203-8.000.

Nagahama, Sigenori: *See—*
Maeda, Yo; Asaoka, Masao; Okamura, Toshiro; Nagahama, Sigenori; Yamaguchi, Yutaka; Hoshi, Ikuo; Takaki, Kiyoshi; Masubuchi, Yorimitu; Iigaya, Haruo; and Nakano, Mineo, 3,855,056.

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Nagasawa, Taro; Ono, Joji; Kudo, Tutomu; and Harada, Yoshitugu, to Morinaga Milk Industry Co., Ltd. Process for producing a microbial proteinous substance. 3,855,063, Cl. 195-28.00r.

Nagata, Minoru: *See—*
Masuda, Hiroo; Masuhara, Toshiaki; Nagata, Minoru; and Kozawa, Tokinori, 3,855,610.

Najer, Henry; and Giudicelli, Jean-Francois, to Synthelabo. 2-(3'-Trifluoromethylthio-anilino)-benzoic acid and salts thereof with pharmaceutically acceptable bases. 3,855,230, Cl. 260-294.80g.

Nakada, Jun: *See—*
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Nakagawa, Junio: *See—*
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Nakajima, Hitoshi; Nomura, Fujio; and Iszwa, Shinichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Selective methylation of phenols. 3,855,318, Cl. 260-621.00r.

Nakajima, Tethuo; and Maeda, Yoshihisa. Filter case assembly. 3,855,127, Cl. 210-90.000.

Nakamura, Isamu. Roll blind. 3,854,517, Cl. 160-323.000.

Nakano, Mineo: *See—*
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Nakano, Ryuzo; and Yamazaki, Takeo, to Aisin Seiki Kabushiki Kaisha. Journalling joint for connecting arms to each other. 3,854,829, Cl. 403-162.000.

Nakano, Tatsuo: *See—*
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Nandi, Arabinda K.; Costanza, Sam T.; and Wheatley, Charles E., III, to Rockwell International Corporation. Ultra high frequency single mode oscillation controlled by a surface acoustic wave crystal. 3,855,548, Cl. 331-107.00a.

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NCR Corporation: *See*—
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Nelson, Tom Worsley; Sedgwick, Gordon; and Lindop, Roy, to Lucas, Joseph, (Industries) Limited. Flame tubes. 3,854,503, Cl. 138-37.000.
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Neuner, James A., to Westinghouse Electric Corporation. Cyclic or monitoring system for displaying the output of two substantially similar trains of logic. 3,855,590, Cl. 340-413.000.
Neuzil, Richard W., to Universal Oil Products Company. Adsorptive separation of aromatic isomers with adsorbents containing an alcohol substrate. 3,855,333, Cl. 260-674.0sa.
Newingham, Thomas D.; Amaroso, James R.; Coppock, Walter J.; and Williams, Edward S., to Sun Oil Company of Pennsylvania. Mist lubricant. 3,855,135, Cl. 252-15.000.
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Niwa, Koichi; Anzai, Yoshiharu; Hashimoto, Kaoru; and Yokoyama, Hiromi, to Fujitsu Limited. Method of manufacture of alumina substrate with improved smoothness and electrical properties. 3,854,965, Cl. 106-62.000.
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Noda, Hiroshi, to Sanwa Tetsuki Kougiyou Kabushiki Kaisha. Clamp assembly for steel core aluminum stranded wire. 3,854,172, Cl. 24-122.300.
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Notelteirs, Victor Rosallie; and Van Beek, Ferdinandus Maria Josephus, to U.S. Philips Corporation. Method of manufacturing a halogen incandescent lamp. 3,854,786, Cl. 316-20.000.
Nozaki, Michio B., to Rheem Manufacturing Company. Vortex humidifier for forced flow hot air furnace. 3,854,468, Cl. 126-113.000.
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Okreglak, Richard Z., to AMF Incorporated. Thread cutting and clamping means. 3,854,356, Cl. 83-66.000.
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Oldham, Kenneth Gordon; and Carr, Noel Gordon, to United Kingdom Atomic Energy Authority. Isotopically labelled compounds. 3,854,240, Cl. 47-1.400.
O'Leary, Kevin J., to Electronor Corporation. Novel electrolysis method. 3,855,092, Cl. 204-128.000.
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Oliver, Ward H., to Ciba-Geigy Corporation. Process for the production of 4,4-dibromobenzil. 3,855,287, Cl. 260-523.00r.
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Olson, John M. Tachometer. 3,855,572, Cl. 340-52.00f.
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Pader, Morton; and Richberg, Carl G., to Lever Brothers Company. Enzymatic denture cleanser. 3,855,142, Cl. 252-135.000.
Pak, Se Bin. Rotary automatic sprinkler valve. 3,854,534, Cl. 169-42.000.
Paladino, Dick. Oboe fingering system and mouthpiece. 3,854,369, Cl. 84-380.000.
Palena, Maximilian. Metal bonded non-skid coating and method of making same. 3,855,444, Cl. 219-76.000.
Palma, James R. Fluid mixer. 3,854,701, Cl. 259-8.000.
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Papenmeier, Gunther; deceased (by Papenmeier, Luise, nee Mellies; widow). Method and device for the continuous production of synthetic resin messes. 3,854,702, Cl. 259-8.000.
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Parduhn, Alfred P. Signal mastarm bracket assembly. 3,854,685, Cl. 248-214.000.
Park, George C., to Bolton-Emerson, Inc. Apparatus for applying barrier coating substances to sheet materials. 3,854,441, Cl. 118-34.000.
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Paule, Kurt; Zilly, Gunter; and Reiss, Willy, to Bosch, Robert, G.m.b.H. Electrically operated manual power tool. 3,854,203, Cl. 30-220.000.
Paule, Michael L. Sharpening device for cutting implements such as razor blades. 3,854,251, Cl. 51-158.000.
Paull, Stephen; and Crafton, Paul A., to Constellation Corporation. Electric control motor driven lock mechanism. 3,854,310, Cl. 70-280.000.
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Pautrat, Rene; and Marteau, Jacques, to ANVAR Agence Nationale de Valorisation de la Recherche. Method for the chemical modification of ethylenically unsaturated polymers and products obtained thereby. 3,855,348, Cl. 260-79.30r.
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Pirooz, Perry P., to Owens-Illinois, Inc. Method of forming transparent glass ceramic with compression layer. 3,854,919, Cl. 65-32.000.
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Polata, Bohumil; Marley, James A., Jr.; and Kerr, John T., 1/2 each to Signetics Corporation and Corning Glass Works. Bipolar transistor structure having ion implanted region and method. 3,855,007, Cl. 148-1.500.
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Poupin, Raymond; and Anfossi, Henri, to Service d'Exploitation Industrielle des Tabacs et des Allumettes. Device for conveying rod-shaped objects such as cigarettes. 3,854,567, Cl. 198-20.00c.

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Prasad, Raj Nandan, to Abbott Laboratories. Process for preparing adenosine-5'-carboxylic acid, ethyl ester. 3,855,204, Cl. 260-211.50r.

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Cowardin, Robert L.; Matuck, George C.; McCray, Charles M.; Powell, Flavius M.; Pratt, Woodrow W.; Thomas, Delbert C., Jr.; and Thorne, William D., 3,854,563.

Prescott, Ernest F.: *See—*
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Preston, Edward G.: *See—*
Molins, Desmond W.; Labbe, Francis A. M.; Preston, Edward G.; and Jackson, Norman W., 3,854,487.

Preus, Paul. Preparation of perlite-asphalt-fiber compositions for separating hydrocarbons from water. 3,855,152, Cl. 252-430.000.

Priesmeyer, Paul T.: *See—*
Oliver, John P.; Wedel, Alfred W.; and Priesmeyer, Paul T., 3,854,211.

Probstmeyer, Helmuth, to Dorr-Oliver Incorporated. Solid bowl conveyer type centrifuge. 3,854,658, Cl. 233-7.000.

Prochazka, Jaroslav; and Rod, Vladimir, to Ceskoslovenska akademie ved. Apparatus for bringing fluid phases into mutual contact. 3,855,368, Cl. 261-81.000.

Procter & Gamble Company, The: *See—*
Pultinas, Edmund P., Jr., 3,855,257.
Rizzi, George P., 3,855,301.

Product Potentials, Inc.: *See—*
Buckland, William J., Jr.; and O'Daly, Kevin C., 3,855,588.

Prohaszka, Janos; Welesz, Rudolf; and Mandoki, Andor, to Licencia Talalmanyokat Ertekesito Vallalat. Quick heat treatment of steels. 3,855,013, Cl. 148-12.00r.

Proper, Davis S.; and Rueger, William J., to International Business Machines Corporation. Article conveying. 3,854,605, Cl. 214-16.40a.

Provasnik, Robert: *See—*
Truscelli, Peter J.; and Provasnik, Robert, 3,855,622.

Provinsky, Jerry, to Bunker Ramo Corporation. Electrical connector assembly. 3,854,790, Cl. 339-198.0ga.

Puchtler, Martin. Ski construction, particularly for children. 3,854,745, Cl. 280-11.35a.

Puckett, Sam S., to Atlas Aquariums, Inc. Aquarium assembly. 3,854,450, Cl. 119-5.000.

Pulido, Miguel L.: *See—*
Buckman, Stanley J.; and Pulido, Miguel L., 3,854,928.

Puls, Walter: *See—*
Frommer, Werner; Puls, Walter; and Schmidt, Delf, 3,855,066.

Pulsepower Systems Inc.: *See—*
Elmore, Lester C.; and Broxholm, Thomas M., 3,854,376.

Pultinas, Edmund P., Jr., to Procter & Gamble Company, The. Preparation of carboxylic acids by the oxidation of vicinal glycols. 3,855,257, Cl. 260-413.000.

Pulzmeister Interholding GmbH: *See—*
Schlecht, Karl, 3,854,847.

Puolustusministerio: *See—*
Huhta-Koivisto, Esko Ensio, 3,855,005.

Pursley, John A., to Rockwell International Corporation. Apparatus for preparing chlorine pentafluoride. 3,854,886, Cl. 23-260.000.

Quermann, Thomas R., to Sperry Rand Corporation. Multiple rotation gyroscope with a single moving element. 3,854,341, Cl. 74-5.700.

Quinn, Daniel J.; and Paradis, Edouard L., to United Aircraft Corporation. Cylindrical RF sputtering apparatus. 3,855,110, Cl. 204-298.000.

Quisenberry, Carter E., to AMF Incorporated. Pedal operated shoe brake for juvenile bike. 3,854,555, Cl. 188-24.000.

Rabanus, Kurt. Letting-out of hides and similar materials. 3,854,309, Cl. 69-23.000.

Ragoss, Hans: *See—*
Groos, Ekkehard; and Ragoss, Hans, 3,855,058.

Rairden, John R., III: *See—*
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Raleigh, Ronald George: *See—*
Gilman, Paul Brewster, Jr.; Raleigh, Ronald George; and Merrigan, Joseph Andrew, 3,854,949.

Randau, Dieter; and Schnell, Wolfram, to Merck Patent Gesellschaft mit beschrankter Haftung. Column for pressure chromatography. 3,855,130, Cl. 210-198.00c.

Rankine, Robin Patrick; Earl, David George; and Mellor, Roger, to Western Research & Development Ltd. Method for monitoring and controlling the efficiency of a chemical process. 3,854,876, Cl. 23-230.00r.

Ransomes Sims & Jefferies Limited: *See—*
Aldred, Edward J., 3,854,271.

Ranz, James R., to Philips Industries Inc. Blower wheel. 3,854,844, Cl. 416-184.000.

Rao, Ramesh P., to Fiberglas Canada Limited. Process for producing low thermal conductivity high strength silica foam. 3,855,393, Cl. 423-339.000.

Rapistan Incorporated: *See—*
Bowman, Clyde L., 3,854,576.

Rapp, Guenther: *See—*
Becker, Lothar; Kahr, Kurt; Rapp, Guenther; and Mannheim, Otto Waschka, 3,855,080.

Raptis, George M. Roto-piston internal combustion engine. 3,854,460, Cl. 123-44.00r.

Rapun, Raul: *See—*
Rutner, Herman; Rapun, Raul; and Lewin, Nathan, 3,855,208.

Rathje, Werner, to Boehringer Mannheim GmbH. Reagent for the determination of calcium. 3,854,880, Cl. 23-230.00b.

Rauhaus, Gerd: *See—*
Bauer, Carl Otto; Bode, Ernst; Diehl, Karl; and Rauhaus, Gerd, 3,854,350.

Raycon Corporation: *See—*
Check, John M.; and Rupert, Gary F., 3,855,442.

Raymond, Maurice A.: *See—*
Gay, Walter A.; and Raymond, Maurice A., 3,855,305.

Raytheon Company: *See—*
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Razdan Raj K.; and Thompson, William R. Benzopyran-5-ols. 3,855,229, Cl. 260-293.580.

RCA Corporation: *See—*
Balzer, Daniel Lee; and Lake, Ralph Jones, Jr., 3,854,905.
Carlson, David John, 3,855,550.
Dorsey, Denis Peter; and Rodda, William E., 3,855,497.
Huener, Robert Charles; and Fillmore, Richard Plumb, 3,855,549.
Hurford, Winslow Leroy, 3,855,419.
Kane, James, 3,854,992.
Kawamoto, Hirohisa, 3,855,605.
Kressel, Henry; Lockwood, Harry Francis; and Hawrylo, Frank Zygmunt, 3,855,607.
Leidich, Arthur John, 3,855,540.
Leidich, Arthur John, 3,855,541.
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Napoli, Louis Sebastian; and Dean, Raymond Harkless, 3,855,613.
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Reardon, Daniel Francis: *See—*
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Rebuffe, Pascal: *See—*
Jouet, Etienne; and Rebuffe, Pascal, 3,854,530.

Recognition Equipment Incorporated: *See—*
Renfrow, Donald F., 3,854,613.

Reddy, Junuthula N., to Bendix Corporation, The. Fuel injection control system. 3,854,458, Cl. 123-32.0ea.

Reed, James C., to Manufacturing Approaches & Total Concepts, Inc. Self-gauging mitre saw. 3,854,360, Cl. 83-468.000.

Regie Nationale des Usines Renault: *See—*
Brielle, Maurice G., 3,854,849.

Regitz, William M.: *See—*
Karp, Joel A.; and Regitz, William M., 3,855,483.

Reichert, Heinz, to Eaton Corporation. Hourmeter for equipment having short operating times. 3,854,281, Cl. 58-145.00r.

Reichhold Chemicals, Inc.: *See—*
Chang, Gerald M., 3,855,153.

Reid, John D.; Reinhardt, Robert M.; Kullman, Russell M. H.; and Cashen, Norton A., to United States of America, Agriculture. Use of sodium bisulfite in an improved process for the treatment of cellulose textile materials with carbamate finishing agents an sulfurous acid. 3,854,873, Cl. 8-187.000.

Reid, Robert John. Method of forming structural joints. 3,854,185, Cl. 29-155.00r.

Reinhard, Edward J. Tool for adjusting diesel governors. 3,854,464, Cl. 123-140.00r.

Reinhardt, Robert M.: *See—*
Reid, John D.; Reinhardt, Robert M.; Kullman, Russell M. H.; and Cashen, Norton A., 3,854,873.

Reinhoudt, Jacobus Pieter, to U.S. Philips Corporation. Grooved air bearing head. 3,855,624, Cl. 360-103.000.

Reinmuth, Klaus, to Elektroschmelzwerk Kempten GmbH. High temperature- and corrosion-resistant material. 3,854,967, Cl. 106-65.000.

Reinsma, Harold L., to Caterpillar Tractor Company. Noise attenuating impact absorbing means for sprocket teeth and track. 3,854,345, Cl. 74-243.00r.

Reiss, Willy: *See*—
Paule, Kurt; Zilly, Gunter; and Reiss, Willy, 3,854,203.

Reitz, Leonard M.: *See*—
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Relton Corporation: *See*—
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Rembold, John P., to United Aircraft Corporation. Self-trimming control for turbofan engines. 3,854,287, Cl. 60-236.000.

Remington Arms Company, Inc.: *See*—
Bateman, Charles H., Jr.; Campbell, Allan A.; and Capasso, James J., 3,854,331.
Eckstein, George R.; and Moyher, William G., 3,855,381.
Whitney, Paul V., Jr.; Bolen, Robert J.; and Cotter, William W., Jr., 3,854,898.

Removille, Jacques Robert Philippe; and Schmit, Francois, to European Atomic Energy Community (Euratom). Device and a photographic film package for use in automatic radiography. 3,855,472, Cl. 250-321.000.

Rendulic, Francis J.: *See*—
Guthrie, James L.; and Rendulic, Francis J., 3,855,093.

Renfrow, Donald F., to Recognition Equipment Incorporated. Batch to continuous flow mail handling. 3,854,613, Cl. 214-314.000.

Renth, Ernst-Otto; Schromm, Kurt; and Mentrup, Anton, to Boehringer Ingelheim GmbH. Process for preparation of derivatives of L-tyrosine. 3,855,062, Cl. 195-2.000.

Republic of France: *See*—
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Republic Steel Corporation: *See*—
Highberger, Grant H., 3,854,708.

Reti, Adrian R.: *See*—
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Rexnord Inc.: *See*—
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Theijsmeijer, Frederik; and Krivec, Bert, 3,854,574.

Reynolds Products, Inc.: *See*—
Krueger, Harvey R., 3,854,390.

Rhee, Chonokook John: *See*—
George, William Lloyd; Hays, Robert Guy; and Rhee, Chonokook John, 3,855,608.

Rhee, Hackchan, to RCA Corporation. Circuit breaker with ambient temperature compensation. 3,855,562, Cl. 337-75.000.

Rheem Manufacturing Company: *See*—
Nozaki, Michio B., 3,854,468.

Rhodenizer, Harold L.: *See*—
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Rhone-Poulenc S.A.: *See*—
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Giraudon, Raymond, 3,855,272.
Jamet, Bruno, 3,854,904.

Ric-Wil, Incorporated: *See*—
Couch, Robert O., 3,854,756.

Richard, Joseph D. Method for determining direction and speed of ocean currents. 3,854,333, Cl. 73-170.00a.

Richardson, Edwin A.: *See*—
Suman, George O., Jr.; Richardson, Edwin A.; and Scheuerman, Ronald F., 3,854,538.

Richardson, Jacob C., to Shell Oil Company. Hermaphroditic connector for seismic cables. 3,855,566, Cl. 339-49.00r.

Richberg, Carl G.: *See*—
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Richter, Freidrich: *See*—
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Ricoh Co. Ltd.: *See*—
Araki, Kunihiko, 3,854,811.
Kato, Saburo, 3,855,620.

Ridgway, Peter Charles, to International Computers Limited. Manufacture of magnetic transducing heads. 3,854,199, Cl. 29-603.000.

Riel, Frank J., to Rohr Industries, Inc. Corrosion resistant adhesive bonding system. 3,855,044, Cl. 161-89.000.

Riess, Gerard: *See*—
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Rieter Machine Works, Ltd.: *See*—
Wildbolz, Rudolz, 3,854,330.

Rippel, Robert: *See*—
Ruschig, Heinrich; Schorr, Manfred; Muschaweck, Roman; and Rippel, Robert, 3,855,243.

Rising, Donald B., to Millipore Corporation. Vented filter holder. 3,854,907, Cl. 55-159.000.

Ristuccia, Donald J., to Westinghouse Electric Corporation. Remotely monitored and controlled transformer. 3,855,503, Cl. 317-27.00r.

Ritchey, Edward R. Process and solution for fixing an image on silver halide prints. 3,854,947, Cl. 96-61.00r.

Ritchie, Joe L.: *See*—
Bethea, Thomas J.; and Ritchie, Joe L., 3,854,275.

Rittler, Hermann L., to Corning Glass Works. AGCL-nucleated glass-ceramic articles. 3,854,963, Cl. 106-39.600.

Ritzerfeld, Gerhard. Applicator and method for making a printing form. 3,854,976, Cl. 117-36.100.

Rizzi, George P., to Procter & Gamble Company, The. Novel dihydrochalcone and process. 3,855,301, Cl. 260-590.000.

Roberts Consolidated Industries, Inc.: *See*—
Hill, Harvey J., 3,854,512.

Roberts, Donald L., to NCR Corporation. Parallel biased photodetector matrix. 3,855,582, Cl. 340-173.0ls.

Roberts, Glenn H.: *See*—
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Robinson, James H.; and Van Benthuysen, John D., to CTS Corporation. Variable resistance control with differentially resilient contacts. 3,855,565, Cl. 338-171.000.

Robinson, James S.; and Folzenlogen, Paul D., to Eastman Kodak Company. Process for separating amorphous polyolefins into fractions having different melt viscosities. 3,855,193, Cl. 260-93.700.

Robinson, Kenneth R.; and Willis, Joseph E., to Ashland Oil, Inc. Liquid phase oxidation of condensed-ring aromatic hydrocarbons. 3,855,252, Cl. 260-385.000.

Robison, James Ray, to International Telephone and Telegraph Corporation. Claus process control system. 3,854,884, Cl. 23-253.00a.

Rockwell International Corporation: *See*—
Carlise, Robert L., 3,855,597.
Gudmundsen, Richard A., 3,855,583.
Molina, Orlando G., 3,855,526.
Nandi, Arabinda K.; Costanza, Sam T.; and Wheatley, Charles E., III, 3,855,548.
Pursley, John A., 3,854,886.
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Rod, Trygve R.: *See*—
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Rod, Vladimir: *See*—
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Rodach, Alexander, to Ungerer, Irma, Frau, geb. Dollinger. Reel for coiling strip. 3,854,671, Cl. 242-74.100.

Rodda, William E.: *See*—
Dorsey, Denis Peter; and Rodda, William E., 3,855,497.

Roderick, Willaim Rodney, to Abbott Laboratories. 2,3-Dihydro-1H-pyridino [2,3-b] [1,4]-thiazine-2-one-4-oxide. 3,855,214, Cl. 260-243.00r.

Rodger, Andrew C.: *See*—
Spicer, Denis F.; and Rodger, Andrew C., 3,855,023.

Rodger, Edward Raymond, to Monsanto Chemical Limited. Inhibiting premature vulcanization of W-type polychloroprene rubber with N-hydrocarbyl-thioimides. 3,855,192, Cl. 260-92.300.

Rodgers, J. Linn. Oscillating sprinkler with snap-in nozzle strip. 3,854,665, Cl. 239-242.000.

Roehsler, Karl Gustav, to Sartorius-Membranfilter GmbH. Multi-layer filter membrane. 3,855,133, Cl. 210-490.000.

Roffelsen, Franciscus, to N.V. Spiro Research. Device for venting and aerating closed circulatory water flow systems. 3,854,906, Cl. 55-159.000.

Rogers, Edward J.: *See*—
Bernatt, Joseph; and Rogers, Edward J., 3,855,433.

Rohm and Haas Company: *See*—
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Rohr Industries, Inc.: *See*—
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Rolff, Klaus-Peter: *See*—
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Romey, Ingo, to Bergwerksverband G.m.b.H. Expansion anchor. 3,854,373, Cl. 85-82.000.

Rony, Peter R.; and Roth, James F., to Monsanto Company. Catalysis. 3,855,307, Cl. 260-604.0hf.

Roos, Axel Sven Olof, to Sandvik Aktiebolag. Tool holder. 3,854,183, Cl. 29-96.000.

Rose, Robert A. Foot measuring device. 3,854,212, Cl. 33-3.00a.

Rosen, Perry: *See*—
Jernow, Jane Liu; and Rosen, Perry, 3,855,250.

Rosenberg, Baruch. Apparatus for picking fruit growing on a tree. 3,854,273, Cl. 56-334.000.

Rosenberg, David, 1/3 interest each to Lampert, Sydney and Wertheimer, Herman. Combination shut-off valve and flow control valve with side access and viewing port for observation, testing and on-line servicing. 3,854,497, Cl. 137-557.000.

Rosi, David: *See*—
Archer, Sydney; and Rosi, David, 3,855,291.

Rosinski, Edward J., to Mobil Corporation. Method of preparing an oxidation catalyst for partially combusted gases. 3,855,388, Cl. 423-213.200.

Ross, Sidney D.; and Finkelstein, Manuel, to Sprague Electric Company. Electrical capacitors having substituted ester impregnants. 3,855,508, Cl. 317-259.000.

Rossi, Albert, to Exxon Research and Engineering Company. Long side chain polymeric flow improvers for waxy hydrocarbon oils. 3,854,893, Cl. 44-62.000.

Rossi, Ronald C., to Aerospace Corporation, The. Process for applying glassy carbon coatings. 3,854,979, Cl. 117-46.0cc.

Rosvold, Warren C., to Signetics Corporation. Schottky barrier diode semiconductor structure and method. 3,855,612, Cl. 357-15.000.

Rotaru, Cornel-Constantin N., to Centrala Industriala de Fibre Chimice. Process and apparatus for the contacting of two or more phases. 3,855,404, Cl. 423-659.000.

Roth, Helmut: *See—*
Steinberg, Diedrich; Johnke, Winfried; Roth, Helmut; Ruf, Walter; Steinbrenner, Ulrich; and Linstedt, Hans, 3,854,466.

Roth, James F.: *See—*
Rony, Peter R.; and Roth, James F., 3,855,307.

Roth, Shirley H.: *See—*
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Roth, Shirley H., to Cities Service Company. Intumescent composition. 3,855,138, Cl. 252-81.000.

Rothlisberger, Alvin C.: *See—*
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Round, Charles: *See—*
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Roussel-UCLAF: *See—*
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Rowland, Stanley P.: *See—*
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Roy, Thomas Paterson, to Imperial Chemical Industries Limited. Manufacture of tetramisole. 3,855,234, Cl. 260-306.70t.

Royal Industries, Inc.: *See—*
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Rudd, David William, to Du Pont de Nemours, E. I., and Company. Winder linkage. 3,854,668, Cl. 242-18.0cs.

Rueger, William J.: *See—*
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Ruf, Walter: *See—*
Steinberg, Diedrich; Johnke, Winfried; Roth, Helmut; Ruf, Walter; Steinbrenner, Ulrich; and Linstedt, Hans, 3,854,466.

Ruff, Claus Werner, to Loewe-Opta GmbH. Method of processing a spent copper etching solution for reuse in an electroless copper recovery baths. 3,855,141, Cl. 252-79.200.

Runggas, Friedrich: *See—*
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Rupert, Gary F.: *See—*
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Ruschig, Heinrich; Schorr, Manfred; Muschaweck, Roman; and Rippel, Robert, to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning. 3-Aminoacylamino thiophenes. 3,855,243, Cl. 260-332.20c.

Rushmere, John Derek, to Du Pont de Nemours, E. I., and Company. Acid zinc electroplating electrolyte, process and additive. 3,855,085, Cl. 204-55.00r.

Russell, Donald H., to Atlantic Richfield Company. Polyurethane foam system. 3,855,159, Cl. 260-2.5am.

Russell, Ian M.: *See—*
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Russell, Robert H., to Bird Machine Company, Inc. Doctor blade holder. 3,854,162, Cl. 15-256.510.

Rutkowski, Herbert: *See—*
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Rutner, Herman; Rapun, Raul; and Lewin, Nathan, to Becton, Dickinson and Company. Derivatives of digoxigenin. 3,855,208, Cl. 260-239.570.

Ryon, Donald C., to Motorola, Inc. Dual vibrato system. 3,854,367, Cl. 84-1.250.

S&C Electric Company: *See—*
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Saab-Scania Aktiebolag: *See—*
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Sabel, Alex: *See—*
Kurz, Kieter; Bauer, Johann; Balwe, Thomas; Fendel, Kurt; and Sabel, Alex, 3,855,190.

Sabel, Erik Arne. Method for re-inforcing cast-metal objects, particularly thin plates of hard and brittle cast steel. 3,855,029, Cl. 156-92.000.

Sado, Ichiro, to Canon Kabushiki Kaisha. Static-dynamic conversion system. 3,855,460, Cl. 235-156.000.

Saeki, Keiso; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Process for preparing microscopic capsules containing hydrophobic oil droplets therein. 3,855,146, Cl. 252-316.000.

Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Jammet, Jean, 3,855,000.

Sagami Chemical Research Center: *See—*
Kondo, Kiyosi; Matsumoto, Masakatsu; and Hatsutani, Miyako, 3,855,246.

Sagan, Stanley S., to Westinghouse Electric Corporation. Tube support system for a heat exchanger. 3,854,529, Cl. 165-162.000.

Saganowski, Mieczyslaw: *See—*
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Sahores, Jean; and Ducasse, Henri, to Societe Nationale des Petroles d'Aquitaine. Process and apparatus for X-ray crystallography. 3,855,470, Cl. 250-273.000.

Saidla, Glen W., to Dana Corporation. Container. 3,854,620, Cl. 220-9.00f.

Sakai, Noboru: *See—*
Takemura, Satoshi; Maeda, Mitsuaki; and Sakai, Noboru, 3,854,515.

Sakakibara, Kozo; and Yasuda, Kiyoshi, to Daicel Ltd. Process for producing acetone. 3,855,304, Cl. 260-593.00r.

Sakura Refrigerating & Heating Engineering Co., Ltd.: *See—*
Masuda, Fujio, 3,854,302.

Salas, Frank D. Method of constructing building structures of zigzag profile. 3,854,266, Cl. 52-742.000.

Saleck, Wilhelm: *See—*
Himmelmann, Wolfgang; Von Konig, Anita; Moll, Franz; and Saleck, Wilhelm, 3,854,954.

Salloga, Fred W.; and Burger, Charles R., to United States Pipe and Foundry Company. Double disc gate valve. 3,854,697, Cl. 251-167.000.

Salomon, Georges Pierre Joseph. Guiding and centering device for ski-boot. 3,854,742, Cl. 280-11.35y.

Salomon, Georges Pierre Joseph. Ski safety binding. 3,854,744, Cl. 280-11.35k.

Salon, Guy: *See—*
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Salsgiver, James A.; Houze, Gerald L., Jr.; and Ames, Stuart L., to Allegheny Ludlum Industries, Inc. Method for producing grain oriented silicon steel comprising copper. 3,855,018, Cl. 148-112.000.

Salsgiver, James A.; and Malagari, Frank A., to Allegheny Ludlum Industries, Inc. Processing for high permeability silicon steel comprising copper. 3,855,019, Cl. 148-112.000.

Salsgiver, James A.; and Malagari, Frank A., to Allegheny Ludlum Industries, Inc. Processing for high permeability silicon steel comprising copper. 3,855,020, Cl. 148-112.000.

Salsgiver, James A.; and Malagari, Frank A., to Allegheny Ludlum Industries, Inc. Processing for high permeability silicon steel comprising copper. 3,855,021, Cl. 148-112.000.

Saltz, Ira, to Oxford Pendaflex Corporation. Index card holder. 3,854,589, Cl. 211-45.000.

Samejima, Toshihide; and Ooi, Yasuhiro, to Kabushiki Kaisha Seikosha. Electronic stop-watch and timepiece. 3,854,277, Cl. 58-39.500.

Samiran, David; and Moore, Arthur H. Expandable ring connecting device. 3,854,833, Cl. 403-377.000.

Samuels, Samuel: *See—*
Samuels, Stanley J.; and Samuels, Samuel, 3,854,150.

Samuels, Stanley J.; and Samuels, Samuel. Joint for cushioned toilet seat. 3,854,150, Cl. 4-237.000.

Sanchez, Jose, to Pennwalt Corporation. Di (2-phenoxyethyl) peroxydicarbonate. 3,855,351, Cl. 260-861.000.

Sanchez, Moises Gali: *See—*
Triggiani, Leonard Vincent; Sanchez, Moises Gali; and Ashby, George Elliott, 3,855,061.

Sanda, Joseph C., Jr., to Firestone Tire & Rubber Company, The. Pneumatic tire treads and their production. 3,855,177, Cl. 260-42.470.

Sanders, Robert N.: *See—*
Shapiro, Hymin; Giraitis, Albert P.; and Sanders, Robert N., 3,855,054.

Sandor, Louis: *See—*
Germain, Andrew Gerald; Dressel, William George; and Sandor, Louis, 3,854,899.

Sandoz-Wander, Inc.: *See—*
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Sandvik Aktiebolag: *See—*
Merkell, Karl Ake; and Carlen, Jan-Christer Henric Ovesson, 3,854,363.
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Sankyo Chemical Industries, Ltd.: *See—*
Takahashi, Makoto; Shioya, Tsunetoshi; Kobayashi, Takashi; Fujii, Tatsuji; and Nishimura, Masakuni, 3,855,300.

Sansbury, Jerry F.: *See—*
Fox, James D.; Norman, Earl P., Jr.; and Sansbury, Jerry F., 3,855,026.

Sanwa Tetsuki Kougiyou Kabushiki Kaisha: *See—*
Noda, Hiroshi, 3,854,172.

Sanyo-Kokusaku Pulp Co., Ltd.: *See—*
Okabe, Jiro; Machihara, Akira; Kaneyasu, Mutsumi; and Kato, Kojiro, 3,854,995.

Sapinski, Stanley. Training aid for stringed musical instrument. 3,854,370, Cl. 84-485.000.

Sarantakis, Dimitrios, to American Home Products Corporation. Novel intermediates for synthesis of --L-(5-oxoprolyl)-L-histidy-L-tryptophyl-L-seryl-L-tyrosyl-L-glycyl-L-leucyl -L-arginyl-L-prolyl-glycine amide-and process for preparation of --L-(5-oxoprolyl)-L-histidyl-L-tryptophyl-L-seryl-L-tyrosyl-L-glycyl -L-leucyl-L-arginyl-L-prolyl-glycine amide. 3,855,198, Cl. 260-112.500.

Sargent, Duane S.: *See—*
Greytak, Donald A.; and Sargent, Duane S., 3,854,396.

Sarnacke, Philip M.; and Archer, Wesley L., to Dow Chemical Company. Stabilization of ethyl cellulose with sodium omicron and RHO nitrobenzoates. 3,854,958, Cl. 106-14.000.

Sartorius-Membranfilter GmbH: *See—*
Roehsler, Karl Gustav, 3,855,133.

Sasaki, Takashi: *See—*
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Sato, Akira: *See—*

Shiba, Keisuke; Amano, Hiroyuki; Ueda, Hirozo; and Sato, Akira, 3,854,953.
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Sato, Hiroki; and Yoshida, Norimitsu, to Neturen Company, Ltd. Spaced forwarding device for cut wire. 3,854,317, Cl. 72-422.000.
Sato, Masamichi; and Fukushima, Osamu, to Xerox Corporation. Method for transferring a toner image. 3,854,974, Cl. 117-17.000.
Satoh, Yasuo: *See—*
Honda, Soichiro; and Satoh, Yasuo, 3,855,573.
Saunders, Walter Selden. Drag reducer for land vehicles. 3,854,769, Cl. 296-1.00s.
Sawdy, Jack T.: *See—*
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Saxen, Arnold: *See—*
Zimmermann, Friedrich; Seifert, Ernst; Von Freyhold, Helmut; and Saxen, Arnold, 3,854,241.
Sayigh, Adnan A. R.; Stuber, Fred A.; and Ulrich, Henri, to Upjohn Company, The. Process for chemically bonding a dyestuff to a polymeric substrate. 3,854,946, Cl. 96-35.100.
Schadler, Harvey W.; and Rairden, John R., III, to General Electric Company. Vacuum deposition of multi-element coatings and films with single source. 3,854,984, Cl. 117-93.300.
Schaefer, Donald W.: *See—*
Peterson, Charles E.; and Schaefer, Donald W., 3,854,604.
Schaffner, Carl P.: *See—*
Gordon, Harry W.; and Schaffner, Carl P., 3,855,409.
Scharre, Edward W., to General Electric Company. Packaged article including blocking and cushioning means. 3,854,579, Cl. 206-320.000.
Scharrenbroich, Helmut: *See—*
Fischer, Stefan; Galden, Peter; Scharrenbroich, Helmut; and Wollschlager, Dieter, 3,854,857.
Schartel, Ronald S., to Rockwell International Corporation. Stuffer crimper yarn guide means. 3,854,178, Cl. 28-1.600.
Schelkmann, Wilhelm, to Vakuum Vulk Holdings Ltd. Method and apparatus for applying a tread strip to a carcass. 3,855,030, Cl. 156-130.000.
Schering AG: *See—*
Plum, Hans; Runggas, Friedrich; Von Haaren, Manfred; and Krase, Horst, 3,854,960.
Scherr, Eugen: *See—*
Wagner, Ulrich; Scherr, Eugen; and Fuchslocher, Karl-Dieter, 3,854,649.
Scheuerman, Ronald F.: *See—*
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Schexnayder, Lawrence F., to Caterpillar Tractor Company. Relief valve system for a scraper apron. 3,854,381, Cl. 91-414.000.
Schick Incorporated: *See—*
Doyle, Edward J.; Landis, Earle; and Saganowski, Mieczyslaw, 3,854,489.
Schiele, August, to Keller & Knappich Augsburg Zweigniederlassung der Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Tank turret for automatic weapons. 3,854,377, Cl. 89-36.00k.
Schierz, Winfried, to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m. b. H. Semiconductor arrangement and method of production. 3,854,198, Cl. 29-588.000.
Schilson, Robert E.: *See—*
Merrill, La Vaun S., Jr.; and Schilson, Robert E., 3,855,336.
Schindel, Wesley Gerald, to Du Pont de Nemours, E. I., and Company. Reactivation of spent chromic fluoride catalysts. 3,855,151, Cl. 252-415.000.
Schinke, Hans-Joachim: *See—*
Breu, Karl-Jan; Hoher, Herbert; and Schinke, Hans-Joachim, 3,855,438.
Schlecht, Karl, to Pulzmeister Interholding GmbH. Apparatus for damping the pressure increase of hydrostatic drives. 3,854,847, Cl. 417-212.000.
Schlitz, Jos., Brewing Company: *See—*
Knaus, Dennis A.; and Wysocky, Richard E., 3,854,230.
Schmerling, Louis, to Universal Oil Products Company. Aralkyl alkyl ethers of polymethylene glycols. 3,855,316, Cl. 260-611.00a.
Schmerling, Louis, to Universal Oil Products Company. Alkylation of saturated hydrocarbons. 3,855,325, Cl. 260-666.00p.
Schmid Laboratories, Inc., mesne: *See—*
Gordon, Harry W.; and Schaffner, Carl P., 3,855,409.
Schmidt, Adolf: *See—*
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Franklin, Mark E.; and Schmidt, James R., 3,854,210.
Schmidt, Robert J., to Chevron Research Company. Resiliency testing device. 3,854,328, Cl. 73-91.000.
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Loliger, Willi; and Schmied, Rudolf, 3,854,874.
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Schmitt, Wilhelm: *See—*
Franz, Dietmar; and Schmitt, Wilhelm, 3,854,732.
Schmitz, Joseph F., to Whirlpool Corporation. Self-propelled upright vacuum cleaner. 3,854,164, Cl. 15-340.000.
Schneider, Karl Heinz. Arrangement for producing heat. 3,855,449, Cl. 219-287.000.
Schneider, Richard C., to International Business Machines Corporation. Phase shift reducing digital signal recording having no D.C. component. 3,855,616, Cl. 360-40.000.
Schneider, William P.: *See—*
Pike, John E.; and Schneider, William P., 3,855,270.
Schnell, Wolfram: *See—*
Randau, Dieter; and Schnell, Wolfram, 3,855,130.
Schnitta, Edward: *See—*
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Schnoring, Hildegard: *See—*
Schon, Nikolaus; Schnoring, Hildegard; and Pampus, Gottfried, 3,854,981.
Schoberl, Werner, to Licentia Patent-Verwaltungs-G.m.b.H. Semiconductor arrangement. 3,855,606, Cl. 357-17.000.
Scholtholt, Josef: *See—*
Beyerle, Rudi; Stachel, Adolf; Nitz, Rolf-Eberhard; and Scholtholt, Josef, 3,855,223.
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Schon, Nikolaus; Schnoring, Hildegard; and Pampus, Gottfried, to Bayer Aktiengesellschaft. Process for embedding or enveloping solid materials. 3,854,981, Cl. 117-62.100.
Schonfeld, Arnold: *See—*
Gluskin, Richard S.; Barcaro, Eugene B.; Phillips, Edwin R.; Schonfeld, Arnold; and Van Reymersdal, Joseph, 3,855,621.
Schoot, Cornelis Johannes: *See—*
Van Dam, Hendrik Tajapko; Ponjee, Johannes Jacobus; and Schoot, Cornelis Johannes, 3,854,794.
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Schroeter, Siegfried H., to General Electric Company. Curable compositions from blend of maleimido compound and vinyl ether. 3,855,180, Cl. 260-47.0ua.
Schroll, Craig R., to United Aircraft Corporation. Liquid electrolyte fuel cell with gas seal. 3,855,002, Cl. 136-86.00r.
Schromm, Kurt: *See—*
Renth, Ernst-Otto; Schromm, Kurt; and Mentrup, Anton, 3,855,062.
Schucktanz, Gerhard: *See—*
Mayer, Hans; Schroder, Heinz-Jurgen; and Schucktanz, Gerhard, 3,854,453.
Schueler, Claus, to BBC Brown, Boveri & Company, Ltd. Powderized cobalt rare earth metal compounds and process for making such compounds. 3,855,017, Cl. 148-105.000.
Schueli, Alexander Alfred, to U.S. Philips Corporation. System including a transmitter and a receiver for the transmission of binary signals located in periodical clock intervals. 3,855,533, Cl. 325-60.000.
Schuessler, Richard D. Disposable hanger retainer for display racks. 3,854,591, Cl. 211-123.000.
Schuh, Eduard: *See—*
Helmschrott, Norbert; Kelch, Heinz; Schuh, Eduard; and Zimmermann, Hans, 3,855,599.
Schuil, Roelof Egbert, to U.S. Philips Corporation. Luminescent lithium silicate activated with trivalent cerium. 3,855,143, Cl. 252-301.40f.
Schultz, William C.: *See—*
Batesky, Donald C.; and Schultz, William C., 3,855,238.
Schulze-Berge, Karl J.; and Allard, John Joseph, to AMF Incorporated. Demand defrost control system. 3,854,915, Cl. 62-155.000.
Schwarz, Karlhans, to Bodenseewerk Geratetechnik GmbH. Circuit arrangement for linearization of the characteristic of a sensor. 3,855,466, Cl. 250-212.000.
Schweizerische Industrie-Gesellschaft: *See—*
Blochlinger, Ernst, 3,854,409.
Schweizerische Lokomotio-und Maschienfabrik: *See—*
Hinnen, Hermann; and Borgeaud, Gaston, 3,854,420.
Sciacca, Angelo J.; and Milam, Thomas B., to United Aircraft Corporation. Reflecting device construction. 3,854,799, Cl. 350-310.000.
Scifres, Zach M., III: *See—*
Church, Herman S.; Hagener, James L.; and Scifres, Zach M., III, 3,854,765.
Scot Meat Products Limited: *See—*
Ackroyd, Harry Briggs, 3,854,391.
Seabury, Almon D.: *See—*
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Seaman, Russell L.: *See—*
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Seibert, John W.: *See—*

Burroughs, James E.; Seibert, John W.; and Hoppesch, Joseph P., 3,854,320.

Seibold, John, to Wesco Industries Corporation. Drive means for positive yarn feeding devices mounted on a circular knitting machine. 3,854,307, Cl. 66-132.00t.

Seifert, Ernst: *See—*
Zimmermann, Friedrich; Seifert, Ernst; Von Freyhold, Helmut; and Saxen, Arnold, 3,854,241.

Seikisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Kanno, Isawo; Takashima, Toshiyuki; and Bokuda, Yoshiyuki, 3,855,055.

Selmeczi, Joseph G.; and Kestner, Daniel W., to Dravo Corporation. Sludge stabilization with gypsum. 3,855,391, Cl. 423-242.000.

Semikron Gesellschaft fur Gleichrichterbau und Elektronik m. b. H.: *See—*
Schierz, Winfried, 3,854,198.

Senkbeil, Herman O., to Dow Chemical Company, The. Method of controlling undesired vegetation with 2h-pyrido (3,2-b)--1,4-oxazin-3(4h) ones. 3,854,926, Cl. 71-94.000.

Sensi, John E.; and Wehner, George O., to PPG Industries, Inc. Threshold mounted in a molten glass delivery apparatus. 3,854,922, Cl. 65-172.000.

Senyard, Corley P.: *See—*
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Sergeev, Nikolai Sergeevich: *See—*
Medem, Vulf Matveevich; Boldrev, Sergei Andreevich; Karpenko, Leonty Petrovich; Dolukhanov, Rafik Tsaturovich; and Sergeev, Nikolai Sergeevich, 3,855,116.

Sergeys, Francis J., to Grace, W. R., & Company. Method of preparing a heat exchanger. 3,854,186, Cl. 29-157.30d.

Service d'Exploitation Industrielle des Tabacs et des Allumettes: *See—*
Poupin, Raymond; and Anfossi, Henri, 3,854,567.

Severs, Glen Maurice, Jr., to Celanese Corporation. Process for producing an alkenyl alkanoate from an olefin and a carboxylic acid. 3,855,280, Cl. 260-497.00a.

Sevier, Peter E.: *See—*
Dore, James E.; Sevier, Peter E.; and Yarwood, John C., 3,854,934.

Seymour Foods, Inc.: *See—*
Willsey, Charles H., 3,854,394.
Willsey, Charles H., 3,854,568.

Shaff, Jeanne Mull. Automatic dough kneader for home use. 3,854,705, Cl. 259-185.000.

Shakespeare Company: *See—*
Wilson, Richard I., 3,854,723.

Shaltz, Gregory P.; and van Loo, Carl G., to Could Inc. Fluid filter bypass valve. 3,855,128, Cl. 210-130.000.

Shander, Otto A.: *See—*
MacDonnell, Robert W.; and Shander, Otto A., 3,854,417.

Shapiro, Hymin; Giraitis, Albert P.; and Sanders, Robert N., to Ethyl Corporation. Sulfur adhesive for wood laminate. 3,855,054, Cl. 161-182.000.

Shapiro, Stanley; and Caron, Ronald N., to Olin Corporation. Processing copper base alloys. 3,855,012, Cl. 148-11.50r.

Sharmaitis, Romas Romovich; Vilutene, Valentina Alexeevna; and Matulis, Juozas Juozovich. Composition and method for color passivation of zinc and cadmium. 3,855,010, Cl. 148-6.210.

Sharp, Denis: *See—*
Skoyles, Derek R.; and Sharp, Denis, 3,854,779.

Sharp, John R., to Polaroid Corporation. Photographic apparatus for use with a film handling cassette having film strip tension regulating means therein. 3,854,806, Cl. 352-130.000.

Sharp, Michael; and Johansson, Gillis. Ion-selective electrode. 3,855,097, Cl. 204-195.00m.

Sharpe, Grace S., 20% to Lee, Raymond, Organization, Inc., The. Dog dropping disposal kit. 3,854,578, Cl. 206-223.000.

Shatwell, John: *See—*
Billany, Michael Royston; Longworth, Arthur Raymond; and Shatwell, John, 3,855,140.

Shaw, Jack R.: *See—*
Bishop, Bill H.; and Shaw, Jack R., 3,854,656.

Shell Oil Company: *See—*
Broussard, Douglas E.; Hemphill, Dean P.; Kolb, Robert H.; and Macy, Robert H., 3,854,297.
Richardson, Jacob C., 3,855,566.
Suman, George O., Jr.; Richardson, Edwin A.; and Scheuerman, Ronald F., 3,854,538.

Shen, Michael T. Noise reduction apparatus employing parametric frequency dividers with large division factors. 3,855,615, Cl. 360-30.000.

Sherman, Carl W.: *See—*
Weber, Charles F.; and Sherman, Carl W., 3,854,661.

Shiba, Keisuke; Amano, Hiroyuki; Ueda, Hirozo; and Sato, Akira, to Fuji Photo Film Company, Ltd. Direct positive-type multi-layer light-sensitive material. 3,854,953, Cl. 96-101.000.

Shiba, Keisuke; Hinata, Masanao; Sato, Akira; Ogawa, Akira; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Supersensitized silver halide photographic emulsions. 3,854,955, Cl. 96-124.000.

Shibuya, Chisei: *See—*
Kato, Toshio; and Shibuya, Chisei, 3,855,274.

Shigemori, Hideto: *See—*
Hatanaka, Yoshihiro; Shigemori, Hideto; and Kitagami, Hisashi, 3,854,490.

Shim, Kyung S., to Stauffer Chemical Company. Polyalkylene glycol alkyl or haloalkyl poly-phosphonates. 3,855,360, Cl. 260-929.000.

Shimadzu Seisakusho, Ltd.: *See—*
Kita, Yasuo, 3,854,492.

Shin-Kobe Electric Machinery Company, Limited: *See—*
Ono, Kazuo; Tsuchiya, Tadao; Kawamoto, Akio; and Nakada, Jun, 3,855,376.

Shinetsu Chemical Company: *See—*
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Yamanaka, Yoshio; Toide, Takashi; and Yamamoto, Hiromi, 3,855,087.

Shingler, Thomas M., to Cyclops Corporation. Mobile outrigger for scaffolds. 3,854,550, Cl. 182-36.000.

Shiotsu, Tstsuzo; and Adachi, Toshio, to Leben Utility Co., Ltd. Thermosetting foamable resinous composition. 3,855,160, Cl. 260-2.50n.

Shioya, Tsunetoshi: *See—*
Takahashi, Makoto; Shioya, Tsunetoshi; Kobayashi, Takashi; Fujii, Tatsuji; and Nishimura, Masakuni, 3,855,300.

Shivinsky, Joseph A.: *See—*
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Shooter, Kenneth L.: *See—*
Kelly, James E.; Shooter, Kenneth L.; and Lawter, Ray L., 3,855,432.

Shorten, James A. Direct reading specific gravity indicator. 3,854,338, Cl. 73-433.000.

Showa Denko K.K.: *See—*
Akamatsu, Akiyuki, 3,854,890.

Shu, Ping: *See—*
Dann, Murray; Korshalla, Joseph Daniel; and Shu, Ping, 3,855,410.

Shue, Robert S., to Phillips Petroleum Company. Olefin coupling in the presence of palladium carboxylates. 3,855,329, Cl. 260-668.00r.

Shuford, Lloyd N. Quick adjusting guide rail for conveyor. 3,854,688, Cl. 248-316.00a.

Sick, Erwin, to Sick, Erwin, Optik-Elektronik. Mounting for optical device. 3,854,687, Cl. 248-276.000.

Sick, Erwin, Optik-Elektronik: *See—*
Sick, Erwin, 3,854,687.

Sidell, Philip A., to McGraw-Edison Company. Synchronous motor with flux conductor. 3,855,490, Cl. 310-162.000.

Siemens Aktiengesellschaft: *See—*
Breu, Karl-Jan; Hoher, Herbert; and Schinke, Hans-Joachim, 3,855,438.
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Bucherl, Erwin; and Peters, Walter, 3,854,659.
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Signetics Corporation: *See—*
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Rosvold, Warren C., 3,855,612.

Siirtola, Esko Eemeli. Scoop belt conveyor. 3,854,571, Cl. 198-162.000.

Silverado Industries, Inc., mesne: *See—*
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Silvestri, Achille: *See—*
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Simpson, Melvyn I.: *See—*
Mold, James D.; Kallianos, Andrew G.; Means, Richard E.; and Simpson, Melvyn I., 3,854,485.

Sinden, Frank William, to Bell Telephone Laboratories, Incorporated. Main distribution frame interconnection wiring technique and apparatus. 3,855,427, Cl. 179-98.000.

Singer Company, The: *See—*
Hickey, Roy E., 3,854,807.

Singer, Helmut: *See—*
Dohr, Manfred; Singer, Helmut; and Umbach, Wilfried, 3,855,255.

Singer, Helmut, to Henkel & Cie GmbH. Polybasic unsaturated carboxylic acid esters. 3,855,278, Cl. 260-485.00r.

Singer, Malcolm Scott, to Chevron Research Company. 1,3-Disubstituted-5-(substituted thio) imino-2,4-imidazolidine diones and the 4-thio analogs. 3,854,925, Cl. 71-92.000.

Skarbo, Roald R., to Kennecott Copper Corporation. Process for recovering nickel selectively. 3,855,090, Cl. 204-106.000.

SKF Industrial Trading and Development Company B.V.: *See—*

Bildtsen, Sven Christian, 3,854,781.
SKF Kugellagerfabriken GmbH: *See*—
Bartling, Gerhard, 3,854,274.
Skidmore, Paul H., to United States of America, Navy. Linear composition for rocket motors comprising cross linked carboxy terminated polybutadiene with inert filler. 3,855,176, Cl. 260-42.280.
Skoyles, Derek R.; and Sharp, Denis, to U.S. Philips Corporation. Anti-lock vehicle brake systems. 3,854,779, Cl. 303-21.00p.
Skytram Systems, Inc.: *See*—
Cocroft, Kelly H., 3,854,407.
Cocroft, Kelly H., 3,854,419.
Sleppy, William C.; and Campbell, Ronald J., to Aluminum Company of America. Carbon anode protection in aluminum smelting cells. 3,855,086, Cl. 204-67.000.
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Slowbe, Joseph A. Joint construction between supported and supporting members. 3,854,253, Cl. 52-2.000.
Slusarchyk, William A.: *See*—
Dolfini, Joseph Edward; Bohme, Ekkehard; and Slusarchyk, William A., 3,855,233.
Smethers, Rollo G., Jr., to Lockheed Aircraft Corporation. Water-based airplane especially designed for adaptation to stol. 3,854,679, Cl. 244-106.000.
Smith, Charles L.: *See*—
Minnick, Leonard John; Webster, William C.; and Smith, Charles L., 3,854,968.
Smith, Curtis P.; and Ulrich, Henri, to Upjohn Company, The. Cycloalkane, cycloalkene, and cycloalkanone phosphonates. 3,855,363, Cl. 260-944.000.
Smith, Duane L.: *See*—
Bohler, Walter; and Smith, Duane L., 3,854,818.
Smith, Frank T.; and Smith, Robert D., to Du Pont de Nemours, E. I., and Company. Liquid heat exchange system. 3,854,523, Cl. 165-1.000.
Smith, Graydon. Continuous incremental feed filtration process and apparatus. 3,855,126, Cl. 210-77.000.
Smith, Kent F.: *See*—
Huber, Robert J.; Fordemwalt, James N.; and Smith, Kent F., 3,855,008.
Smith Kline & French Laboratories: *See*—
Dunn, George L.; and Hoover, John R. E., 3,855,213.
Smith, Leary W.: *See*—
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Smith, Matthew: *See*—
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Smith, Richard Allan: *See*—
Brendzel, Henry Tzvi; and Smith, Richard Allan, 3,855,423.
Smith, Robert D.: *See*—
Smith, Frank T.; and Smith, Robert D., 3,854,523.
Smith, Robert T., Jr., to Philco-Ford Corporation. Radio tuning apparatus. 3,854,342, Cl. 74-10.500.
Smith, Stephen Hagar, to McCulloch Corporation. Traction motor controller circuit and method. 3,855,511, Cl. 318-317.000.
Smith, Stuart L. Apparatus and method for the application of a continuous somatic nerve block. 3,854,477, Cl. 128-213.000.
Smith, Warren K., to United States of America, Navy. Incendiary capture device. 3,854,332, Cl. 73-167.000.
Smrt, Thomas J. Actuating assembly for aerosol spray can. 3,854,632, Cl. 222-182.000.
Snape, George W., to Bulk Unit Load Systems Limited. Container discharge systems. 3,854,612, Cl. 214-308.000.
Snezhko, Valery Grigorievich: *See*—
Kotova, Valentina Georgievna; Akopian, Gretel Artashesovna; Galitsky, Anatoly Ivanovich; Golin, Jury Petrovich; Snezhko, Valery Grigorievich; Kolesnichenko, Leonid Georgievich; Ivanenko, Larisa Akimovna; and Nekrasov, Jury Fedorovich, 3,855,446.
Snook, Ernest R.; and Nicklas, William H., to General Electric Company. Shadow mask and process for manufacture. 3,855,493, Cl. 313-85.00s.
Snow, George, to Foseco International Limited. Grain refining compositions and method of refining aluminum therewith. 3,854,935, Cl. 75-68.00r.
Snyder, Clair Wilson, Jr., to AMP Incorporated. Integral housing and strain relief. 3,854,787, Cl. 339-103.00r.
Societe a Responsabilite Limitee dite: Institut de Recherches Chimiques ET Biologiques Appliquees, I.R.C.E.B.A.: *See*—
Debat, Jacques, 3,855,317.
Societe Anonyme dite: Orsymonde: *See*—
Lafon, Louis, 3,855,249.
Societe Anonyme dite: Vallourec (Usines a Tubes de Lorraine-Escaut et Vallourec Reunies): *See*—
Duret, Jean, 3,854,760.
Societe Anonyme Francaise du Ferodo: *See*—
Fieni, Walter, 3,854,749.
Societe Anonyme Petrole Service: *See*—
Lenseigne, Jean Paul, 3,855,559.
Societe Aquitane-Total-Organico: *See*—
Potin, M. Philippe; and Biesan, M. Michel, 3,855,182.
Societe dite: Manufacture de Produits Chimiques PROTEX Societe francaise a Responsabilite Limitee Siege Social: *See*—
Balland, Jean, 3,854,872.
Societe Nationale des Petroles d'Aquitaine: *See*—
Mendelsohn, Jean Claude; and Blanc, Jean Henri, 3,855,330.
Sahores, Jean; and Ducasse, Henri, 3,855,470.
Societe Pour l'Equipment des Industries Chimiques Speichim: *See*—
Marecaux, Paul, 3,855,076.
Sodomka, Karel: *See*—
Bandoch, Rudolf; and Sodomka, Karel, 3,854,305.
Soignet, Donald M.: *See*—
Ward, Truman W.; Benerito, Ruth R.; Berni, Ralph J.; and Soignet, Donald M., 3,854,867.
Sola, Manuel Mamerto. Shaping head for plastic molding machines. 3,854,859, Cl. 425-466.000.
Solbeck, Erik. Machine for producing non-woven nettings. 3,855,036, Cl. 156-426.000.
Solco Basel AG: *See*—
Buchner, Stanisulaus; and Fischer, Dragica, 3,855,201.
Solender, Peter E., to Sylvania Electric Products Inc. Analog to digital converter with variable quantization and dynamic range. 3,855,589, Cl. 340-347.0ad.
Solitron Devices, Inc.: *See*—
Adams, Guy, 3,854,465.
Sollima, Vincent: *See*—
Langer, Helmut; and Sollima, Vincent, 3,855,492.
Solomon, Carola: *See*—
Podesva, Ctirad; and Solomon, Carola, 3,855,294.
Son, Pyong-Nae, to Goodrich, B. F., Company, The. (Hydrocarbonthio) oxamide vulcanization retarders. 3,855,261, Cl. 260-453.00r.
Sonoco Products Company: *See*—
Fletcher, Wade D., 3,854,249.
Fox, James D.; Norman, Earl P., Jr.; and Sansbury, Jerry F., 3,855,026.
Sonomoto, Kazuhiko: *See*—
Nemoto, Tadashi; Watanabe, Kiyoshi; Kobayashi, Tadaaki; Ishihara, Joo; Ono, Kenji; and Sonomoto, Kazuhiko, 3,855,015.
Sony Corporation: *See*—
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Ishigaki, Yoshio; and Hongu, Masayuki, 3,855,551.
Kiuchi, Masao, 3,855,521.
Okada, Takashi, 3,855,614.
Takizawa, Kazuyuki, 3,854,730.
Yanagisawa, Yuzuru, 3,855,500.
Sorli, Duncan C., to Polaroid Corporation. Photographic processor for large format film units. 3,854,812, Cl. 354-312.000.
Soto, Jose J. Accident prevention device. 3,854,438, Cl. 116-28.00r.
Souza, Edward A.: *See*—
Karlik, Steven, Jr.; Hyland, William J.; and Souza, Edward A., 3,855,505.
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Gluskin, Richard S.; Barcaro, Eugene B.; Phillips, Edwin R.; Schonfeld, Arnold; and Van Reymersdal, Joseph, 3,855,621.
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Quermann, Thomas R., 3,854,341.
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Walters, Ronald Bernard; and Hamey, Peter Michael, 3,854,382.
Speyer, Fred B., to TRW Inc. Polyhydroxy fillers for pattern materials. 3,854,962, Cl. 106-38.700.
Spicer, Denis F.; and Rodger, Andrew C., to Texas Instruments Incorporated. Manufacture of masks. 3,855,023, Cl. 156-11.000.
Spicuzza, John P., Jr.: *See*—
Uebelhart, James J.; and Spicuzza, John P., Jr., 3,855,377.
Spiegel, Norman, to Nasta Industries, Inc. Moving figure toy roundabout. 3,854,716, Cl. 272-31.00r.
Spiegel, Ray W.; Wassilak, Chester W.; and Corn, Adolph D., to Whirlpool Corporation. Rotary handle door latch for dishwashers. 3,854,762, Cl. 292-197.000.
Spies, Klaus, to Bochumer Eisenhutte Heintzmann & Co. Lining for underground excavations. 3,854,293, Cl. 61-45.00d.
Sponseller, David L.: *See*—
Morrow, Hugh, III; and Sponseller, David L., 3,854,941.
Sprague Electric Company: *See*—
Ross, Sidney D.; and Finkelstein, Manuel, 3,855,508.
Sprinter Pack AB: *See*—
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Bruer, Hermann; and Treuner, Uwe D., 3,855,211.
Dobben, Glenn D., 3,855,405.
Dolfini, Joseph Edward; Bohme, Ekkehard; and Slusarchyk, William A., 3,855,233.
Squires, Arthur M. Hydropyrolysis of hydrocarbonaceous fuel at short reaction times. 3,855,070, Cl. 201-23.000.
St. Joe Minerals Corporation: *See*—
Brockmiller, Charles Anthony; Lund, Robert E.; and Fitzsimmons, John Edward, 3,855,387.
Staats, Henry N., to General Binding Corporation. Method of making embossable monolithic identification credit card. 3,855,033, Cl. 156-220.000.

Staats, James E., to General Electric Company. Electronic dryer. 3,854,219, Cl. 34-1.000.

Staats, James E.; and Fitzmayer, Louis H., to General Electric Company. Microwave oven having preferred modes. 3,855,440, Cl. 219-10.55f.

Stachel, Adolf: *See—*
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Beyerle, Rudi; Stachel, Adolf; Nitz, Rolf-Eberhard; and Scholtholt, Josef, 3,855,224.
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Beyerle, Rudi; Stachel, Adolf; Nitz, Rolf-Eberhard; and Scholtholt, Josef, 3,855,223.
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Stachel, Ingeburg Lydia Katherina: *See—*
Beyerle, Rudi; Stachel, Adolf; Nitz, Rolf-Eberhard; and Scholtholt, Josef, 3,855,225.

Staendeke, Horst, to Hoechst Aktiengesellschaft, mesne. Production of dialkylphosphines. 3,855,311, Cl. 260-606.50p.

Staffier, Thomas L.: *See—*
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Standard Oil Company: *See—*
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Lovell, Lyle M.; Johnston, Walker F.; and Kramer, Gerald J., 3,854,637.
Ott, Louis E., 3,854,923.
Wang, Chen-Shen, 3,855,332.

Standridge, Robert E., to Evans Products Company. Apparatus for injecting colorant into injection molding machine. 3,854,630, Cl. 222-135.000.

Stang Hydronics Inc.: *See—*
Walker, Raymond Andre, 3,854,243.
Walker, Raymond Andre, 3,854,244.

Stanoy, Mark: *See—*
Barnett, George J.; Stanoy, Mark; and Watson, Robert L., 3,854,838.

Stanray Corporation: *See—*
Allen, John W., 3,854,425.
Johnston, James G., 3,854,706.

Stansbury, Thomas A. Hydraulic jet stern steering control. 3,854,437, Cl. 115-12.00r.

Starck, Herman C.: *See—*
Kilp, Frithjof Ernst Josef, 3,855,447.

Stark, Karl; Achterwinter, Werner; and Brauer, Karl-Heinz, to Daimler-Benz Aktiengesellschaft. Sealing strip for motor vehicles. 3,854,247, Cl. 49-495.000.

Stark, Robert William, to Monarch Marking Systems, Inc. Pinning method and apparatus. 3,854,190, Cl. 209-432.100.

Stauffer Chemical Company: *See—*
Flasch, John Robert, 3,854,961.
Shim, Kyung S., 3,855,360.
Weil, Edward D., 3,855,359.
Weil, Edward D., 3,855,365.

Steckle, Charles, to United States Steel Corporation. Safety snubber for counterweight. 3,854,387, Cl. 98-59.000.

Steckler, Robert, to Alcolac Inc. Phosphate esters of hydroxyalkyl acrylates and hydroxyalkyl methacrylates. 3,855,364, Cl. 260-952.000.

Steidl, Robert Elling, to Bell Telephone Laboratories, Incorporated. Supervisory circuit. 3,855,420, Cl. 179-17.00a.

Stein, Herman Hal: *See—*
Prasad, Raj Nandan; and Stein, Herman Hal, 3,855,206.

Stein Industrie: *See—*
Pouderoux, Pierre; Salon, Guy; and Andro, Jean, 3,854,528.

Steinberg, Diedrich; Johnke, Winfried; Roth, Helmut; Ruf, Walter; Steinbrenner, Ulrich; and Linstedt, Hans, to Bosch, Robert, G.m.b.H. Ignition system for an internal combustion engine. 3,854,466, Cl. 123-148.00e.

Steinbrenner, Ulrich: *See—*
Steinberg, Diedrich; Johnke, Winfried; Roth, Helmut; Ruf, Walter; Steinbrenner, Ulrich; and Linstedt, Hans, 3,854,466.

Steinhart, Gilbert; and Bock, Heinrich, to Nabisco, Inc. Conveyor system for manufactured articles, particularly confections. 3,854,569, Cl. 198-34.000.

Stenger, Richard E.; Gardella, Arthur J.; and Campbell, Thomas C., to General Electric Company. Combustor dome assembly. 3,854,285, Cl. 60-39.660.

Stephens, Buckeye, Limited: *See—*
Bardet, Michel, 3,854,452.

Stephenson, Jack G.; and Mosier, John E., to Halliburton Company. Railway unit cushioning apparatus. 3,854,596, Cl. 213-8.000.

Stephenson, Russell D. Gold pan. 3,855,119, Cl. 209-447.000.

Sterling Drug Inc.: *See—*
Archer, Sydney; and Rosi, David, 3,855,291.
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Stetson-Ross Machine Company, Inc.: *See—*
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Stevenson, Gerald W. Variable speed transmission. 3,854,348, Cl. 74-774.000.

Stewart, Alan, to International Telephone and Telegraph Corporation. Electronic hybrid amplifier. 3,855,431, Cl. 179-170.0nc.

Stewart, Donald Fergusson; and Pollard, Leslie John, to ICI Australia Limited. Process of beneficiating titaniferous ore in the presence of hydrogen chloride. 3,854,929, Cl. 75-1.000.

Stich, Frederick A., to Allis-Chalmers Corporation. Control having conduction limit means to vary duty cycle of power switch. 3,855,520, Cl. 323-19.000.

Stickney, William A.: *See—*
Hunter, William L.; Paulson, Danton L.; and Stickney, William A., 3,854,936.

Stievenart, Emile Frans; Deconinck, Hugo Frans; and Muller, Jurgen, to Agfa-Gevaert Aktiengesellschaft. Apparatus for wet treatment of sheet or strip material. 3,854,446, Cl. 118-223.000.

Stimeling, David F., to Mack Trucks, Inc. Fan shroud for an engine cooling system. 3,854,459, Cl. 123-41.040.

Stirling, Robert L. Internal combustion steam generating system. 3,854,283, Cl. 60-39.170.

Stockwell, Richard Kent, to Hewlett-Packard Company. Calculator with key code association and display features. 3,855,461, Cl. 235-156.000.

Stoepel, Kurt: *See—*
Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Stoepel, Kurt; and Bayer Aktiengesellschaft, 3,855,231.

Stog, W., KG Industrie- und Rohrleitungsbau: *See—*
Stog, Wilhelm, 3,854,835.

Stog, Wilhelm, to Stog, W., KG Industrie- und Rohrleitungsbau. Expansion joint. 3,854,835, Cl. 404-68.000.

Stolle Corporation, The: *See—*
Stolle, Ralph J.; Hasselbeck, Richard J.; and Kaminski, Elton G., 3,854,445.

Stolle, Ralph J.; Hasselbeck, Richard J.; and Kaminski, Elton G., to Stolle Corporation, The. Can treating apparatus. 3,854,445, Cl. 118-62.000.

Storage Technology Corporation: *See—*
Herger, Zoltan L.; Kavanagh, Thomas S.; Olmsted, Dennis R.; and Campbell, Ronald R., 3,854,674.

Stout, George H., to Vapor Corporation. System for generating a digital signal indicative of shaft position with automatic error correction. 3,855,585, Cl. 340-347.0ad.

Striker, Gyorgy; and Gyurusi, Bela, to Merestechnikai Kozponti Kutato Laboratorium. Fault-indicating circuit for a flow-metering system. 3,855,480, Cl. 307-118.000.

Strudgeon, George E.; and Loven, Andrew W., to Zurn Industries, Inc. Upflow-downflow sorption process 210/031.000. 3,855,123, Cl. .

Stuber, Fred A.: *See—*
Sayigh, Adnan A. R.; Stuber, Fred A.; and Ulrich, Henri, 3,854,946.

Styhr, Karsten H.: *See—*
Ezis, Andre; Goodyear, Michael U.; and Styhr, Karsten H., 3,854,189.

Suchard, Luis. Air-conditioning system for motor vehicles. 3,854,303, Cl. 62-426.000.

Suda, Hideaki; Dohgane, Iwao; Hosaka, Hirokazu; and Ebara, Kazunari, to Sumitomo Chemical Company, Limited. Method for producing pure M-cresol. 3,855,195, Cl. 260-96.50c.

Suddeutsche Kuhlerfabrik Julius Fr. Behr, Firma: *See—*
Illg, Manfred, 3,854,525.

Sullivan, Alfred Bay; and Wilder, Gene Ray, to Monsanto Company. Stable compositions for inhibiting polymerization of unsaturated carboxylic acid esters. 3,855,281, Cl. 260-486.00r.

Sulzer Brothers Ltd.: *See—*
Bosshardt, Ernst, 3,854,875.
Pfarrwaller, Erwin, 3,854,506.

Suman, George O., Jr.; Richardson, Edwin A.; and Scheuerman, Ronald F., to Shell Oil Company. Hydrated metal oxide deposition. 3,854,538, Cl. 175-72.000.

Sumitomo Chemical Company, Limited: *See—*
Suda, Hideaki; Dohgane, Iwao; Hosaka, Hirokazu; and Ebara, Kazunari, 3,855,195.

Sumitomo Shipbuilding & Machinery Co., Ltd.: *See—*
Kinoshita, Yoshitaka, 3,854,435.

Summers, William A.; Christy, Betty L.; and Sweeney, Joseph V., to Ebasco Services Incorporated. Monitor and results computer system. 3,855,456, Cl. 235-151.300.

Sun Oil Company of Pennsylvania: *See—*
Newingham, Thomas D.; Amaroso, James R.; Coppock, Walter J.; and Williams, Edward S., 3,855,135.

Sun Research and Development Co.: *See—*
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Sun Ventures, Inc.: *See—*
Angstadt, Howard P., 3,855,334.
Dugan, William P., 3,855,132.
Lyons, James E., 3,855,323.

Sundstrom, Erik Wilhelm, to Sandvik Aktiebolag. Saw blade. 3,854,364, Cl. 83-835.000.

Superior Concrete Accessories, Inc.: *See—*
Colado, Joseph J.; and Turner, Norman G., 3,854,258.

Supran, Lyle David. Tennis ball having an electrically conducting surface. 3,854,719, Cl. 273-61.00r.

Suzuki, Hisao. Silencing apparatus. 3,854,548, Cl. 181-56.000.

Suzuki, Taneko: *See—*
Matsukawa, Hidehiko; Ito, Haruo; and Suzuki, Taneko, 3,855,196.

Suzuki, Yoshinori; and Iwasaki, Yukio, to Kowa Chemical Industry Ltd. Method for applying mastic paint compositions to concrete bases. 3,854,985, Cl. 117-111.00d.

Sweeney Gerald T., to Tigre Tierra, Inc. Drilling apparatus with down hole motor. 3,854,539, Cl. 175-92.000.

Sweeney, Joseph V.: *See—*
Summers, William A.; Christy, Betty L.; and Sweeney, Joseph V., 3,855,456.

Sweger, Theodore J., to Illinois Railway Equipment Company. Retractable container support for railway flat cars. 3,854,422, Cl. 105-366.00d.

Swiss Aluminum Ltd.: *See—*
Dore, James E.; Sevier, Peter E.; and Yarwood, John C., 3,854,934.

Switzer, George; and Bolez, Carl A., to Gilbert Associates, Inc. Method of converting coal to pipeline quality gas. 3,854,896, Cl. 48-210.000.

Switzer, George W., Jr., to Gilbert Associates, Inc. Process for pulverizing coal to ultrafine size. 3,854,666, Cl. 241-18.000.

Swotinsky, Jacob M.; Colitti, Olindo A.; and Confides, James J., to United States of America, Army. Process for making nitrocellulose base propellants. 3,855,373, Cl. 264-3.00b.

Sylten, Hans D.: *See—*
Holcomb, Jack N.; and Sylten, Hans D., 3,855,534.

Sylvania Electric Products Inc.: *See—*
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Syntex Corporation: *See—*
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Synthelabo: *See—*
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Tack, Carl Edward: *See—*
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Tadanier, John Soloman: *See—*
Hallas, Robert; Tadanier, John Soloman; and Von Esch, Anne Mary, 3,855,203.

Tagami, Shuji, to Kabushiki Kaisha Tagami Kanagata. Apparatus for enabling automatic feed for a press with one-stamping die. 3,854,359, Cl. 83-212.000.

Taguchi, Tetsuya: *See—*
Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, 3,855,601.

Takahashi, Iwao: *See—*
Toda, Takashi; Kimizuka, Katsumi; and Takahashi, Iwao, 3,854,739.

Takahashi, Makoto; Shioya, Tsunetoshi; Kobayashi, Takashi; Fujii, Tatsuji; and Nishimura, Masakuni, to Sankyo Chemical Industries, Ltd. Process for the production of 2-amino-1-butanol. 3,855,300, Cl. 260-584.00r.

Takahashi, Toru: *See—*
Yamaji, Keizo; Katayama, Hajime; Takahashi, Toru; Ohashi, Shoji; and Nishigaki, Yuji, 3,854,224.

Takaki, Kiyoshi: *See—*
Maeda, Yo; Asaoka, Masao; Okamura, Toshiro; Nagahama, Sigenori; Yamaguchi, Yutaka; Hoshi, Ikuo; Takaki, Kiyoshi; Masubuchi, Yorimitu; Iigaya, Haruo; and Nakano, Mineo, 3,855,056.

Takamizawa, Minoru; and Umemura, Mitsuo, to Shinetsu Chemical Company. Method of preparing phenylchlorosilanes. 3,855,259, Cl. 260-448.20t.

Takashima, Toshiyuki: *See—*
Kanno, Isawo; Takashima, Toshiyuki; and Bokuda, Yoshiyuki, 3,855,055.

Takata, Masahiro: *See—*
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Takayama, Teruyuki: *See—*
Yamaguchi, Tetsuo; Takayama, Teruyuki; and Hiderita, Masao, 3,854,193.

Takeda, Yasutsugu; and Oshida, Yoshitada, to Hitachi, Ltd. Holographic memory with random phase illumination hologram. 3,854,791, Cl. 350-3.500.

Takekoshi, Tohru; and Webb, Jimmy L., to General Electric Company. Aryl methylene polymers prepared from chloral, bromal or glyoxalic acid. 3,855,181, Cl. 260-49.000.

Takemura, Satoshi; Maeda, Mitsuaki; and Sakai, Noboru, to Bridgestone Tire Company Limited. Radial tire having polyester card breaker. 3,854,515, Cl. 152-361.000.

Takemura, Takumi: *See—*
Aiso, Hiroshi; Takemura, Takumi; and Takeuchi, Toshinobu, 3,855,401.

Takeshita, Hiroshi; and Teraishi, Katsuhito, to Kabushiki Kaisha Suwa Seikosha. Electronic wrist watch display. 3,854,278, Cl. 58-50.00r.

Takeuchi, Toshinobu: *See—*
Aiso, Hiroshi; Takemura, Takumi; and Takeuchi, Toshinobu, 3,855,401.

Takeya, Kenji; Kobashi, Toshiyuki; and Masuhara, Kenichi, to Japan Exlan Company Limited. Process for producing flame-retardent acrylic fibers. 3,855,382, Cl. 264-210.00f.

Takizawa, Hidehiko; and Hisashige, Mituto, to Denki Kogaku Kogyo Kabushiki Kaisha. Process for the preparation of thermoplastic polymers. 3,855,354, Cl. 260-880.00r.

Takizawa, Kazuyuki, to Sony Corporation. Control mechanism for phonograph record player. 3,854,730, Cl. 274-15.00r.

Talak, John Frank; and Hobson, John Lester, to Deere & Company. Control system for a hydraulically-operable brake and transmission. 3,854,559, Cl. 192-4.00a.

Talvard, Jean-Pierre: *See—*
Flaceliere, Bernard Henri Gabriel; and Talvard, Jean-Pierre, 3,854,564.

Tang, Thomas L. C. Collapsible bicycle. 3,854,755, Cl. 280-278.000.

Tang, Tung-Men: *See—*
Garnier, Michael F.; Tang, Tung-Men; and White, James W., 3,855,625.

Tarman, Paul B.: *See—*
Huebler, Jack; Massey, Lester G.; and Tarman, Paul B., 3,855,403.

Taurozzi, Armando: *See—*
Taurozzi, Eduardo H., 3,854,457.

Taurozzi, Eduardo H., 10% to Taurozzi, Armando, 10% to Taurozzi, Juan Carlos, 10% to Heymann, Jorge Augusto and 30% to Elia, Santiago Sanchez. Rotary engine. 3,854,457, Cl. 123-8.470.

Taurozzi, Juan Carlos: *See—*
Taurozzi, Eduardo H., 3,854,457.

Tavs, Peter: *See—*
Kniese, Wilhelm; Plueckhan, Juergen; Kummer, Rudolf; Nienburg, Hans Juergen; and Tavs, Peter, 3,855,396.

Taylor, David L.: *See—*
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TCI, Inc.: *See—*
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TECSI (Techniques et Systemes Informatiques): *See—*
Battarel, Claude; and Nori, Jean-Pierre, 3,855,584.

Teledyne Mid-America Corporation: *See—*
Church, Herman S.; Hagener, James L.; and Scifres, Zach M., III, 3,854,765.

Temco Products, Inc.: *See—*
Thomas, Morton I., 3,854,773.

Tenney, Horace M.: *See—*
Mertzweiller, Joseph K.; and Tenney, Horace M., 3,855,324.

Teppo, Anna Maija, to Orion-Yhtyma Oy. Method in the quantitative and qualitative determination of molecules having antigenic properties by immunoelectrophoresis. 3,855,094, Cl. 204-180.00g.

Terada, Hiroshi: *See—*
Hatanaka, Yoshihiro; Abe, Masahiro; Terada, Hiroshi; and Inoue, Shigejiro, 3,854,714.

Teraishi, Katsuhito: *See—*
Takeshita, Hiroshi; and Teraishi, Katsuhito, 3,854,278.

Teranishi, Takeo, to Kabushiki Kaisha Tadapura. Arranging shelf. 3,854,783, Cl. 312-108.000.

Terasaki, Katsuhisa. Cigarette holder with tar collecting means. 3,854,488, Cl. 131-210.000.

Terrel, Gordon R.; Hause, Robert T.; Hancox, Alex J.; and McCulley, Fredrick J., to Lau Products, Ltd. Combined grease trap and airfilter for range hoods. 3,854,912, Cl. 55-479.000.

Terry, Bernard William Hugh: *See—*
Costain, Winston; and Terry, Bernard William Hugh, 3,854,959.

Texaco Inc.: *See—*
Braden, William B., Jr., 3,854,532.
Carlin, Joseph T., 3,854,531.
Estes, John H.; Kerr, Edwin R.; and Dorawala, Tansukhlal G., 3,855,335.
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Thanhaeuser, Gerhard, to Siemens Aktiengesellschaft. Oscillator utilizing complementary transistors in a push-pull circuit. 3,855,552, Cl. 331-116.00r.

Tharmaratnam, Poothathamby; and Cluwen, Johannes Meijer, to U.S. Philips Corporation. Information processor for changing tempo of playback from the recorded tempo. 3,855,424, Cl. 179-15.55t.

Theijsmeijer, Frederik; and Krivec, Bert, to Rexnord Inc. Luggage dispensing conveyor. 3,854,574, Cl. 198-181.000.

Thelen, Alfred, to Balzers Patent- und Beteiligungs-Aktiengesellschaft. Reflection-reducing coating. 3,854,796, Cl. 350-164.000.

Thermo Electron Corporation: *See—*
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Thill, Bruce P., to Dow Chemical Company, The. Process for preparing N-benzylically substituted aziridines. 3,855,217, Cl. 260-239.00e.

Thomas, Delbert C., Jr.: *See—*
Cowardin, Robert L.; Matuck, George C.; McCray, Charles M.; Powell, Flavius M.; Pratt, Woodrow W.; Thomas, Delbert C., Jr.; and Thorne, William D., 3,854,563.

Thomas, George L.; and Reitz, Leonard M., to General Electric Company. Lead silicate high voltage vacuum tube glass envelope. 3,854,964, Cl. 106-53.000.

Thomas, Morton L., to Temco Products, Inc. Bedside commode device. 3,854,773, Cl. 297-417.000.

Thomassen, Steinar, to A/S Norema. Telescopic adjustable vertical post for partion walls. 3,854,264, Cl. 52-632.000.

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Thompson, John W., to Westinghouse Electric Corporation. Optical system for wide band light energy. 3,854,821, Cl. 356-152.000.

Thompson, Robert L. Quick-release casting weight means. 3,854,235, Cl. 43-43.120.

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Thornton, Roy F., to General Electric Company. Mercuric oxide electrode and method of forming. 3,854,999, Cl. 136-20.000.

Thumberger, Harold C. Gyratory filter. 3,855,131, Cl. 210-383.000.

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Tilban, Ferend. Multiple clutch strip tensioner. 3,854,672, Cl. 242-75.200.

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Timmermans, Abraham; and DeVaan, Robertus Laurentius Clemens, to U.S. Philips Corporation. Device for producing stimulated infrared emission. 3,855,543, Cl. 331-94.50t.

Tobioka, Takashi, to Fuji Photo Optical Co., Ltd. Exposure time control mechanism for motion picture camera. 3,854,805, Cl. 352-121.000.

Toda, Takashi; Kimizuka, Katsumi; and Takahashi, Iwao, to Unitika Ltd. Skis with steering strings. 3,854,739, Cl. 280-11.13s.

Toide, Takashi: *See*—
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Tomaides, Milos, to Chemtool, Inc. Electrostatic air cleaner. 3,854,903, Cl. 55-147.000.

Tomatsu, Fumio: *See*—
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Tomisawa, Norio; Amano, Takehisa; Uchiyama, Yasuji; and Okumura, Takatoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments reading memorized waveforms for tone generation and tone control. 3,854,365, Cl. 84-1.010.

Tomozawa, Akihiro; Nakata, Kensuke; Kikuchi, Akira; and Agatsuma, Takashi, to Hitachi, Ltd. Method of manufacturing interconnection substrate. 3,855,112, Cl. 204-15.000.

Tompkins, David R., to Plastic Applicators, Inc. Apparatus for inspecting tubular goods. 3,855,465, Cl. 250-360.000.

Topcik, Barry, to Cities Service Company. Process for preparing cellular rubber. 3,855,378, Cl. 264-54.000.

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Triplex Safety Glass Company Limited: *See*—
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Triumph Werke Nuernberg A.G.: *See*—
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Truscelli, Peter J.; and Provasnik, Robert, to Siemens Corporation. Apparatus for loading and unloading a head assembly in a data storage system. 3,855,622, Cl. 360-103.000.

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Trythall, William John Courtney, to Trythall Design and Development Limited. Material handling plants. 3,854,778, Cl. 302-27.000.

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Uchiyama, Takashi; Taguchi, Tetsuya; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Photometer. 3,855,601, Cl. 354-31.000.

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Uebelhart, James J.; and Spicuzza, John P., Jr., to Arco Polymers, Inc. Method for improving internal foam fusion of molded styrene polymer foam billets. 3,855,377, Cl. 264-51.000.

Uecker, Emil, to Hoffmann, Albert and Spechtmeyer, Hans. Gas supply apparatus. 3,854,498, Cl. 137-544.000.

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Ueshima, Michio; Yanagisawa, Isao; Takata, Masahiro; and Ninomiya, Michikazu, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for the preparation of unsaturated carbonyl compounds. 3,855,308, Cl. 260-604.00r.

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Van de Water, Frank. Propeller having angularly disposed tip. 3,854,845, Cl. 416-228.000.
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Vornberger, Walter, to International Shoe Machine Corporation. Roughing machine having counterweighted roughing tool. 3,854,250, Cl. 51-99.000.
Vornberger, Walter, to International Shoe Machine Corporation. Quick-release mechanism for clamping a tool on a hub. 3,854,830, Cl. 403-252.000.
Vossos, Peter H., to Nalco Chemical Company. Preparation of concentrated silica organosols. 3,855,145, Cl. 252-309.000.
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Welty, Robert E., 3,855,574.
Vroemen, Albert Joseph, to Gist-Brocades N.V. Preparation of a proteolytic enzyme. 3,855,064, Cl. 195-65.000.
Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi: *See—*
Bandoch, Rudolf; and Sodomka, Karel, 3,854,305.
WABCO Westinghouse: *See—*
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Wagner Electric Corporation: *See—*
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Wagner, Gunther, Firma: *See—*
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Waldmann, Hermann, to Siemens Aktiengesellschaft. Voltage controller for synchronous electric machines. 3,855,519, Cl. 322-20.000.
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Ohlund, Johan Alex Ingvar; Mannerblad, John; and Wallgard, Gunnar Alexius, 3,854,722.
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Koorneef, Jacob; Potgiesser, Jan Antoon Ludolf; and Walraven, Anthonie, 3,855,618.
Koorneef, Jacob; Potgiesser, Jan Antoon Ludolf; and Walraven, Anthonie, 3,855,629.
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Walters, Ronald Bernard; and Hamey, Peter Michael, to Sperry Rand Limited. Hydraulic actuator controls. 3,854,382, Cl. 91-433.000.
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Walters, Russell W., to BMR Security Products Corporation. Security system and method for valuables. 3,854,603, Cl. 214-16.00b.
Wang, Chen-Shen, to Standard Oil Company. Process for production of polyarylenes. 3,855,332, Cl. 260-670.000.
Ward, Frank L., to Clarostat Mfg., Co., Inc. Multi position rotary detent device. 3,855,560, Cl. 335-302.000.
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Ward, Truman L.; Benerito, Ruth R.; and Berni, Ralph J., to United States of America, agriculture. Non-aqueous process for reacting sultones with cellulosic materials and the product produced. 3,854,868, Cl. 8-116.00r.
Ward, Truman W.; Benerito, Ruth R.; Berni, Ralph J.; and Soignet, Donald M., to United States of America, Agriculture. Process for reacting sultones with cellulosic materials to produce cellulosic materials having both basic and acidic groups and product poduced. 3,854,867, Cl. 8-116.00r.
Warner-Lambert Company: *See—*
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Kaminsky, Daniel; Klutchko, Sylvester; and Von Strandtmann, Maximilian, 3,855,216.
Washburn, Malcolm E., to Norton Company. Control system in an apparatus for reacting silicon with nitrogen. 3,854,882, Cl. 23-253.00a.
Washimi, Koichi: *See—*
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Wassilak, Chester W.: *See—*
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Weaver, Preston R., to UMC Electronics Company. Splice finder. 3,854,643, Cl. 226-35.000.

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Weiant, David S.; Velivis, William R.; and Fitzgerald, John V., to Tile Council of America, Inc. Grout Compositions. 3,854,267, Cl. 52-744.000.

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Hayes, Charles T.; Faust, Donald M.; and Weinert, Harry F., 3,854,606.

Weisberg, Harry: *See*—
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Weissman, Bernard. Drilling machine for plaster casts or models. 3,854,836, Cl. 408-14.000.

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Welty, Robert E., to Vox Industries, Inc. Voice operated alarm system. 3,855,574, Cl. 340-148.000.

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Seibold, John, 3,854,307.

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Western Electric Company, Incorporated: *See*—
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Western Kraft Corporation: *See*—
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White, James W.: *See*—
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White Motor Corporation of Canada Limited: *See*—
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Whitehead & Kales Company: *See*—
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Whitesides, Thomas: *See*—
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Whitney, Paul V., Jr.; Bolen, Robert J.; and Cotter, William W., Jr., to Remington Arms Company, Inc. Method for producing armored rod and wire saws. 3,854,898, Cl. 51-295.000.

Whitney, Thomas A., to Exxon Research and Engineering Company. Hydrocarbon gels. 3,855,137, Cl. 252-62.520.

Widiger, Hans; and Hoffmann, Dieter. Mine car transportation system. 3,854,421, Cl. 105-275.000.

Wilce, Brian J. Fabrication of furnace linings with support frame. 3,854,256, Cl. 52-122.000.

Wilcox, Lance C., to Airpot Corporation. Universal joint for piston-connecting rod assembly. 3,854,557, Cl. 188-322.000.

Wilczewski, Robert Hugh, to Victor Comptometer Corporation. Electromagnetic clutch. 3,854,562, Cl. 192-84.00c.

Wild, John J. Ultrasonic method for systematic search and detection of tissue abnormalities. 3,854,471, Cl. 128-2.00v.

Wildbolz, Rudolz, to Rieter Machine Works, Ltd. Apparatus for measuring mass density variations in a staple fiber sliver on spinning preparatory machines. 3,854,330, Cl. 73-160.000.

Wilder, Gene Ray: *See*—
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Wildman, Alexander J., to Silverado Industries, Inc., mesne. Orthodontic bracket with spring clip retainer means. 3,854,207, Cl. 32-14.00a.

Wilkerson, Edward D. Steering wheel holder. 3,854,171, Cl. 24-81.00a.

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Wilkus, Edward V.; and Berger, Abe, to General Electric Company. Aryl ketone containing organosilicon materials. 3,855,241, Cl. 260-329.300.

Williams, Barbara. Attachment structure for puppet, manipulator combination. 3,854,239, Cl. 46-126.000.

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Williams, Frank J., III: *See*—
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Williams, Vernon L., to Kay Laboratories, Inc. Portable baby warming apparatus. 3,854,156, Cl. 5-347.000.

Willis, Joseph E.: *See*—
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Willis, Wilfred Ernest; and Johnston, Dickie L. Side-loading attachment for forklift trucks. 3,854,616, Cl. 214-620.000.

Willmarth, Charles T. Ski carrier. 3,854,640, Cl. 224-28.00r.

Wills, Frank E., to Borg-Warner Corporation. Solid state switching system for coupling an AC power supply to a load. 3,855,482, Cl. 307-252.00b.

Willsey, Charles H., to Seymour Foods, Inc. Egg liquid extractor apparatus. 3,854,394, Cl. 99-495.000.

Willsey, Charles H., to Seymour Foods, Inc. Article handling apparatus. 3,854,568, Cl. 198-30.000.

Wilson, Homer M., to Petrolite Corporation. Dynamic analyzer. 3,855,101, Cl. 204-195.00r.

Wilson, Richard C., to Aluminum Company of America. Method of making a hollow metal bat with a uniform wall thickness. 3,854,316, Cl. 72-370.000.

Wilson, Richard I., to Shakespeare Company. Hunting arrow. 3,854,723, Cl. 273-106.50r.

Wilson, Roy E., to Allen-Bradley Company. Shaft seal. 3,854,733, Cl. 277-82.000.

Windmoller & Holscher: *See*—
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Winkler, Alvin L., to Interlake, Inc. Variable width strip conditioner. 3,854,315, Cl. 72-165.000.

Winkler, John C.; and Senyard, Corley P., to Esso Research and Engineering Company. Method for preparing resin feed. 3,855,187, Cl. 260-82.000.

Winnick, Charles N.; and Posner, Judd, to Halcon International, Inc. Treatment of terephthalic acid reaction. 3,855,275, Cl. 260-475.0pr.

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Witt, Edward, to Grace, W. R., & Co. Water soluble reaction product of epihalohydrin and alkylamines. 3,855,299, Cl. 260-584.00r.

Witte, Josef: *See—*
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Woodward, Gary F., to Ford Motor Company. Electrical gauge indicator return device. 3,855,532, Cl. 324-154.000.

Woodward, James R., to Rohr Industries, Inc. Liquid interface diffusion method of bonding titanium and/or titanium alloy structure and product using nickel-copper, silver bridging material. 3,854,194, Cl. 29-494.000.

Worrall, Geoffrey, to United Kingdom Atomic Energy Authority. Rollers for shaping sheet material. 3,854,861, Cl. 425-504.000.

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Wyener, Robert L., to United States of America, Navy. Rotating tank demonstrator. 3,854,225, Cl. 35-19.00r.

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Yamada, Yahiko; Okano, Hiroshi; and Yamane, Mikiya, to Hitachi, Ltd. Color display device. 3,855,499, Cl. 315-169.00r.

Yamaguchi, Morio, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Method and apparatus for continuously drying wet non-hygroscopic surfaces of sheet material. 3,854,220, Cl. 34-9.000.

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Yamaji, Keizo; Katayama, Hajime; Takahashi, Toru; Ohashi, Shoji; and Nishigaki, Yuji, to Canon Kabushiki Kaisha. Device for heating and drying copy mediums. 3,854,224, Cl. 34-77.000.

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Yamanaka, Yoshio; Toide, Takashi; and Yamamoto, Hiromi, to Shinetsu Chemical Company. Method for producing rare earth metal-containing alloys. 3,855,087, Cl. 204-71.000.

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Yamasaki, George K., to Westinghouse Electric Corporation. Hollow cathode discharge lamp for generating radiation characteristic of the gas fill within the envelope. 3,855,491, Cl. 313-193.000.

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Yanagisawa, Yuzuru, to Sony Corporation. Gaseous glow-discharge, indicator system. 3,855,500, Cl. 315-169.0tv.

Yanai, Yuichi, to Nisshin Boseki Kabushiki Kaisha. Method of imparting crease resistance to cellulosic fibers by treating them with tetraoxymethylene. 3,854,869, Cl. 116-4.000.

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Yodogawa Steel Works, Ltd.: *See—*
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Yokota, Hideo, to Canon Kabushiki Kaisha. Method for focusing telephoto type optical system. 3,854,797, Cl. 350-214.000.

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Yokoyama, Hiromi: *See—*
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Yoshida, Kyumatsu, to Yoshida Kogyo Kabushiki Kaisha. Slider for concealed zip fasteners. 3,854,175, Cl. 24-205.10r.

Yoshida, Norimitsu: *See—*
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Yoshida, Tadahiro, to Yoshida Kogyo Kabushiki Kaisha. Sliding clasp fastener. 3,854,174, Cl. 24-205.10c.

Young, David W. Shadow antenna. 3,855,591, Cl. 343-5.0ls.

Young, Jas., & Cunningham (Newcastle) Limited: *See—*
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Yurchak, Sergei: *See—*
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Huang, Tracy J.; and Yurchak, Sergei, 3,855,343.

Zaffaroni, Alejandro, to Alza Corporation. Drug-delivery system. 3,854,480, Cl. 128-260.000.

Zahorsky, John Richard, to Crosby Valve & Gage Company. Safety valve. 3,854,494, Cl. 137-472.000.

Zak, Henry; and Conner, Donald E., to Van Dyk & Company, Incorporated. Quaternary halides of gluconamides. 3,855,290, Cl. 260-561.00b.

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Zwahlen, Guenther, to Ciba-Geigy AG. Dyestuff preparations and printing inks. 3,854,969, Cl. 106-176.000.

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Borse, Anton G., to Borse Plastic Products Corp. Disposable urinal. Re. 28,278, 12–17–74, Cl. 4—110.
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Sebel, Harry. Furniture base. 233,926, 12–17–74, Cl. D6—194.
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1 3,854,491
99 3,854,492
360 3,854,493
472 3,854,494
505.44 3,854,495
540 3,854,496
544 3,854,498
557 3,854,497
596.2 3,854,499
601 3,854,500
627.5 3,854,501
629 3,854,502

CLASS 138

37 3,854,503
141 3,854,504

CLASS 139

122N 3,854,505
125 3,854,506

CLASS 141

6 Re.28,275
130 3,854,507
3,854,508

CLASS 144

34R 3,854,510
230 3,854,511
326R 3,854,512

CLASS 148

1.5 3,855,007
3,855,008
3,855,009
6.21 3,855,010
9R 3,855,011
11.5R 3,855,012
12R 3,855,013
28 3,855,014
31.57 3,855,016
34 - 3,855,015
105 3,855,017
112 3,855,018
3,855,019
3,855,020
3,855,021

CLASS 149

8 3,855,022

CLASS 152

158 3,854,513
233 3,854,514
361R 3,854,515
415 3,854,516

CLASS 156

11 3,855,023
17 3,855,024
69 3,855,026
79 3,855,027
3,855,028
92 3,855,029
130 3,855,030
190 3,855,031
201 3,855,032
220 3,855,033
297 3,855,034
306 3,855,035
310 3,855,040
426 3,855,036
442.2 3,855,041
497 3,855,037
499 3,855,038
521 3,855,039
582 3,855,025

CLASS 160

323 3,854,517

CLASS 161

1 3,855,042
5 3,855,043
89 3,855,044
146 3,855,045
150 3,855,046
3,855,047
159 3,855,048
160 3,855,049
165 3,855,050
3,855,051
167 3,855,052
168 3,855,053
182 3,855,054
199 3,855,055

CLASS 162

157R 3,855,056
301 3,855,057

CLASS 164

66 3,854,518
274 3,854,519
291 3,854,520
347 3,854,521

CLASS 165

1 3,854,522
3,854,523
32 3,854,524
39 3,854,459
42 3,854,525
71 3,854,526
120 3,854,527
158 3,854,528
162 3,854,529
163 3,854,530

CLASS 166

272 3,854,531
274 3,854,532
276 3,854,533

CLASS 169

42 3,854,534
48 3,854,535

CLASS 173

15 3,854,536
140 3,854,537

CLASS 174

48 3,855,413
89 3,855,414

CLASS 175

72 3,854,538
92 3,854,539

CLASS 176

19R 3,855,058
36R 3,855,059
3,855,060
75 3,855,061

CLASS 177

136 3,854,540

CLASS 179

1MN 3,855,415
1SA 3,855,416
3,855,417
3,855,418
15AL 3,855,422
15AW 3,855,419
15.55R 3,855,423
15.55T 3,855,424
3,855,425
17A 3,855,420
18FA 3,855,421
98 3,855,427
100.3V 3,855,426
115.5ES 3,855,428
146R 3,855,429
170NC 3,855,430
3,855,431

CLASS 180

5R 3,854,541
12 3,854,542
14A 3,854,543
14E 3,854,544
24.12 3,854,545
70R 3,854,546
117 3,854,547

CLASS 181

56 3,854,548
58 3,854,549

CLASS 182

6 Re.28,273
36 3,854,550
187 3,854,551
222 3,854,552

CLASS 184

6.12 3,854,553

CLASS 187

29R 3,854,554

CLASS 188

24 3,854,555
181R 3,854,556
322 3,854,557

CLASS 190

58A 3,854,558

CLASS 192

4A 3,854,559
27 3,854,560
48.92 3,854,561
84C 3,854,562

CLASS 195

2 3,855,062
28R 3,855,063
65 3,855,064
3,855,065
80R 3,855,066
81 3,855,067
96 Re.28,276

CLASS 196

155 3,855,068

CLASS 197

1R 3,854,563
3,854,564
151 3,854,565
176 3,854,566

CLASS 198

20C 3,854,567
30 3,854,568
34 3,854,569
158 3,854,570
162 3,854,571
174 3,854,572
177R 3,854,573
181 3,854,574
182 3,854,575
184 3,854,576

CLASS 200

48R 3,855,433
61.61 3,855,432
144B 3,855,434
3,855,435
148R 3,855,436
3,855,437
153R 3,855,438
159R 3,855,439

CLASS 201

2.5 3,855,069
23 3,855,070

CLASS 202

121 3,855,071
173 3,855,072
262 3,855,073

CLASS 203

2 3,855,074
8 3,855,075
11 3,855,076
14 3,855,077
37 3,855,078
47 3,855,079
89 3,855,080
91 3,855,081

CLASS 204

1T 3,855,082
15 3,855,112
28 3,855,083
38R 3,855,084
55R 3,855,085
67 3,855,086
71 3,855,087
96 3,855,088
105M 3,855,089
106 3,855,090
128 3,855,091
3,855,092
129 3,855,104
159.15 3,855,093
162R 3,855,105
180G 3,855,094
181 3,855,106
195F 3,855,099
3,855,100
195G 3,855,095
3,855,098
195M 3,855,097
195P 3,855,096
195R 3,855,101
196 3,855,102
201 3,855,107
206 3,855,108
228 3,855,109
298 3,855,110
299 3,855,111
306 3,855,103

CLASS 206

45.33 3,854,577
223 3,854,578
320 3,854,579
426 3,854,580
460 3,854,581
508 3,854,582
520 3,854,583
527 3,854,584

CLASS 208

89 3,855,113
121 3,855,114
135 3,855,115
188 3,855,116
307 3,855,117

CLASS 209

3 3,854,585
111.6 3,854,586
111.7 3,854,587
270 3,855,118
447 3,855,119

CLASS 210

3 3,855,120
11 3,855,121
23 3,855,122
31 3,855,123
44 3,855,124
46 3,855,125
77 3,855,126
90 3,855,127
130 3,855,128
198C 3,855,129
3,855,130
383 3,855,131
455 3,855,132
490 3,855,133

CLASS 211

13 3,854,588
45 3,854,589
74 3,854,590
123 3,854,591

CLASS 212

11 3,854,592
39R 3,854,593
56 3,854,594
145 3,854,595

CLASS 213

8 3,854,596
76 3,854,597
100R 3,854,599
211 3,854,598

CLASS 214

1BB 3,854,600
6BA 3,854,602
6P 3,854,601
16B 3,854,603
16.4A 3,854,604
3,854,605
77R 3,854,606
140 3,854,607
145 3,854,608
147G 3,854,609
302 3,854,611
308 3,854,612
314 3,854,613
339 3,854,614
501 3,854,615
520 3,854,610
620 3,854,616

CLASS 215

307 3,854,618
364 3,854,617

CLASS 219

10.55 3,855,440
68 3,855,441
69E 3,855,442
69G 3,855,443
76 3,855,444
121EB 3,855,445
125PL 3,855,446
145 3,855,447
216 3,855,448
287 3,855,449
367 3,855,450
400 3,855,451
486 3,855,452
553 3,855,453

CLASS 220

1.5 3,854,619
9F 3,854,620
20 3,854,621
85P 3,854,623
306 3,854,622

CLASS 221

96 3,854,624
198 3,854,625
264 3,854,626

CLASS 222

1 3,854,627
103 3,854,628
109 3,854,629
135 3,854,630
146HE 3,854,631
182 3,854,632
183 3,854,633
193 3,854,634
199 3,854,635
402.24 3,854,636
564 3,854,637

CLASS 224

7E 3,854,638
26B 3,854,639
28R 3,854,640
29R 3,854,641

CLASS 226

3 3,854,642
35 3,854,643
79 3,854,644
162 3,854,645
191 3,854,646
198 3,854,647

CLASS 227

136 3,854,648

CLASS 229

3.5MF 3,854,649
14C 3,854,650
34R 3,854,651
43 3,854,652
51R 3,854,653
69 3,854,654

CLASS 232

4R 3,854,655
27 3,854,656

CLASS 233

2 3,854,657
7 3,854,658

CLASS 235

61.11D 3,855,457
61.11E 3,854,661
61.11R 3,854,660
92CT 3,855,454
92PC 3,855,455
151.3 3,855,456
151.34 3,855,458
154 3,855,459
156 3,855,460
3,855,461

CLASS 236

44C 3,854,662
92C 3,854,663

CLASS 239

206 3,854,664
242 3,854,665

CLASS 240

8.24 3,855,462
9A 3,855,463
53 3,855,464

CLASS 241

18 3,854,666
46.11 3,854,667

CLASS 242

18CS 3,854,668
55.19A 3,854,669
67.4 3,854,670
74.1 3,854,671
75.2 3,854,672
86.5R 3,854,509
118.41 3,854,673
154 3,854,675
182 3,854,674
191 3,854,676
195 3,854,677

CLASS 244

3.16 3,854,678
106 3,854,679
118R 3,854,680
3,854,681
154 3,854,682

CLASS 246

40 3,854,683

CLASS 248

68R 3,854,684
214 3,854,685
243 3,854,686
276 3,854,687
316A 3,854,688
340 3,854,689

CLASS 249

19 3,854,690
91 3,854,691
194 3,854,692
210 3,854,693

CLASS 250

212 3,855,466
262 3,855,468
272 3,855,469
273 3,855,470
320 3,855,471
321 3,855,472
328 3,855,473
349 3,855,474
360 3,855,465
369 3,855,479
372 3,855,475
470 3,855,476
473 3,855,477
566 3,855,478
572 3,855,467

CLASS 251

5 3,854,694
129 3,854,695
163 3,854,696
167 3,854,697

CLASS 252

8.1 3,855,134
3,855,138
15 3,855,135
49.5 3,855,136
62.52 3,855,137
79.2 3,855,141
99 3,855,139
106 3,855,140
135 3,855,142
301.4F 3,855,143
3,855,144
309 3,855,145
316 3,855,146
317 3,855,147
359CG 3,855,148
363.5 3,855,149
404 3,855,150
415 3,855,151
430 3,855,152
456 3,855,153
470 3,855,154
473 3,855,155
547 3,855,156

CLASS 254

4C 3,854,699
190R 3,854,698

CLASS 259

4 3,854,700
8 3,854,701
3,854,702
11 3,854,703
118 3,854,704
185 3,854,705

CLASS 260

2BP 3,855,158
2N 3,855,157
2.5AM 3,855,159
2.5F 3,855,161
2.5N 3,855,160
17.4ST 3,855,162
18EP 3,855,163
23.7M 3,855,165
23.7R 3,855,164
28 3,855,167
28.5R 3,855,166
29.2N 3,855,169
29.3 3,855,168
29.6RW 3,855,170
37SB 3,855,171
39R 3,855,172
3,855,173
40R 3,855,174
42.15 3,855,175
42.28 3,855,176
42.47 3,855,177
45.7R 3,855,277
45.7S 3,855,178
45.75K 3,855,179
47UA 3,855,180
49 3,855,181
78L 3,855,182
78.3R 3,855,183
79.3R 3,855,184
3,855,348
80PS 3,855,186
80.78 3,855,185
82 3,855,187
84.3 3,855,188

85.1 3,855,189
87.1 3,855,190
87.5A 3,855,191
92.3 3,855,192
93.1 3,855,361
93.7 3,855,193
94.7A 3,855,194
96.5C 3,855,195
112R 3,855,196
3,855,197
112.5 3,855,198
3,855,199
210AB 3,855,202
210E 3,855,203
210F 3,855,201
210 3,855,200
211.5R 3,855,204
3,855,205
3,855,206
239E 3,855,217
239.55R 3,855,207
239.57 3,855,208
240E 3,855,209
240.9 3,855,210
243A 3,855,215
243C 3,855,211
3,855,212
3,855,213
243R 3,855,214
3,855,216
3,855,218
248CS 3,855,220
248NS 3,855,219
256 3,855,221
256.5R 3,855,222
3,855,223
3,855,224
3,855,225
268R 3,855,226
286R 3,855,227
288R 3,855,228
293.5R 3,855,229
294.8G 3,855,230
3,855,231
295.5B 3,855,232
306.7C 3,855,233
306.7T 3,855,234
309.6 3,855,235
310R 3,855,236
326.14T 3,855,238
326.26 3,855,239
326.8 3,855,237
327P 3,855,240
329.3 3,855,241
330.5 3,855,242
332.2C 3,855,243
335 3,855,244
340.5 3,855,245
340.9 3,855,247
3,855,248
343.3 3,855,250
343.7 3,855,249
346.8R 3,855,251
385 3,855,252
397.6 3,855,253
410.7 3,855,254
410.9R 3,855,255
412.8 3,855,256
413 3,855,257
429.3 3,855,258
448.2T 3,855,259
453R 3,855,260
3,855,261
3,855,262
455A 3,855,263
465E 3,855,265
465G 3,855,264
465.1 3,855,266
465.2 3,855,267
465.3 3,855,268
465.9 3,855,269
468D 3,855,270
468J 3,855,271
470 3,855,272
471C 3,855,276
471R 3,855,273
473R 3,855,274
475PR 3,855,275
485P 3,855,278
486D 3,855,279
486R 3,855,281
497A 3,855,280
501.15 3,855,282
501.17 3,855,283
502.4A 3,855,284
516 3,855,285
519 3,855,286
523R 3,855,287
551P 3,855,288
558H 3,855,289
561B 3,855,290
562N 3,855,291
564RF 3,855,292
564R 3,855,293
570R 3,855,294
570.5CA 3,855,295
570.7 3,855,296
583N 3,855,298
584R 3,855,297
3,855,299
3,855,300
590 3,855,301
3,855,302
593R 3,855,303
3,855,304
600 3,855,305
3,855,306
604HF 3,855,307
604R 3,855,308
606.5P 3,855,309
3,855,310
3,855,311
607A 3,855,312
609E 3,855,313
610B 3,855,314
610D 3,855,315
611A 3,855,316
619R 3,855,317
621R 3,855,318
635D 3,855,319
643F 3,855,320
654R 3,855,321
3,855,322
666PY 3,855,326
666A 3,855,323
666P 3,855,324
3,855,325
668A 3,855,328
668D 3,855,327
668R 3,855,329
669R 3,855,330
3,855,331
670 3,855,332
672R 3,855,335
674SA 3,855,333
674N 3,855,334
674R 3,855,337
679R 3,855,336
680R 3,855,338
683D 3,855,340
683R 3,855,339
683.15D 3,855,341
683.44 3,855,342
3,855,343
683.45 3,855,345
683.46 3,855,344
683.68 3,855,346
683.9 3,855,347
849 3,855,349
857TW 3,855,350
861 3,855,351
873 3,855,352
878R 3,855,353
880R 3,855,354
3,855,355
881 3,855,356
897C 3,855,357
899 3,855,358
928 3,855,359
929 3,855,360
944 3,855,362
3,855,363
952 3,855,364
966 3,855,365

CLASS 261

41B 3,855,366
77 3,855,367
81 3,855,368
90 3,855,369
92 3,855,370
100 3,855,371
131 3,855,372

CLASS 264

3B 3,855,373
24 3,855,374
35 3,855,375
46.1 3,855,376
51 3,855,377
54 3,855,378
77.5CR 3,855,379
97 3,855,380
138 3,855,381
210F 3,855,382
230 3,855,383

CLASS 266

4E 3,854,707
16 3,854,708
3,854,709

CLASS 267

64R 3,854,710
116 3,854,706

CLASS 269

8 3,854,711
43 3,854,712

CLASS 271

3.1 3,854,713
12 3,854,714
277 3,854,715

CLASS 272

31R 3,854,716
70 3,854,717

CLASS 273

41 3,854,718
61R 3,854,719
89 3,854,720
95H 3,854,721
102.2A 3,854,722
106.5R 3,854,723
125R 3,854,724
131A 3,854,725
157R 3,854,726
162F 3,854,727
179A 3,854,728

CLASS 274

1R 3,854,729
15R 3,854,730

CLASS 277

26 3,854,731
58 3,854,732
82 3,854,733
170 3,854,734
189 3,854,735
204 3,854,736
205 3,854,737

CLASS 280

11.13S 3,854,739
11.13W 3,854,738
11.35A 3,854,745
11.35K 3,854,743
3,854,744
11.35R 3,854,740
11.35T 3,854,741
11.35Y 3,854,742
12S 3,854,746
34B 3,854,747
43.12 3,854,748
150SB 3,854,749
150.5 3,854,750
166 3,854,752
236 3,854,753
242R 3,854,754
278 3,854,755

CLASS 285

47 3,854,756
100 3,854,757
114 3,854,758
251 3,854,759
334 3,854,760
336 3,854,761

CLASS 292

197 3,854,762
201 3,854,763
289 3,854,764

CLASS 293

88 3,854,765

CLASS 294

74 3,854,767
88 3,854,766
102R 3,854,768

CLASS 296

1S 3,854,769
98 3,854,770
137B 3,854,771

CLASS 297

353 3,854,772
417 3,854,773
429 3,854,774

CLASS 299

1 3,854,775
67 3,854,776

CLASS 301

37SA 3,854,777

CLASS 302

27 3,854,778

CLASS 303

21F 3,854,780
21P 3,854,779

CLASS 307

118 3,855,480
225R 3,855,481
252B 3,855,482
279 3,855,483
296 3,855,484

CLASS 308

35 3,854,781
38 3,854,782

CLASS 310

8.3 3,855,488
13 3,855,485
49 3,855,486
80 3,855,487
85 3,855,489
162 3,855,490

CLASS 312

108 3,854,783
319 3,854,784
3,854,785

CLASS 313

60 3,855,492
184 3,855,494
193 3,855,491
318 3,855,495
402 3,855,493

CLASS 315

30 3,855,497
39.71 3,855,498
169TV 3,855,500
169R 3,855,499
393 3,855,496

CLASS 316

20 3,854,786

CLASS 317

18C 3,855,501
18D 3,855,502
27R 3,855,503
120 3,855,504
230 3,855,505
3,855,506
258 3,855,507
259 3,855,508

CLASS 318

171 3,855,510
227 3,855,509
317 3,855,511
366 3,855,512
561 3,855,513
660 3,855,514
685 3,855,515

CLASS 320

22 3,855,516
64 3,855,517

CLASS 321

2 3,855,518

CLASS 322

20 3,855,519

CLASS 323

19 3,855,520
49 3,855,521

CLASS 324

30A 3,855,522
34TK 3,855,524
34D 3,855,523
3,855,525
37 3,855,530
38 3,855,526
60C 3,855,527
65R 3,855,531
117R 3,855,528
154 3,855,532
158MG 3,855,529

CLASS 325

60 3,855,533
118 3,855,534
471 3,855,535

CLASS 328

92 3,855,536
167 3,855,537
175 3,855,538

CLASS 329

104 3,855,539

CLASS 330

14 3,855,540
22 3,855,541
34 3,855,542

CLASS 331

94.5C 3,855,547
94.5E 3,855,545
94.5H 3,855,546
94.5T 3,855,543
94.5 3,855,544
107A 3,855,548
108D 3,855,549
109 3,855,550
113R 3,855,551
116R 3,855,552
117R 3,855,553
167 3,855,554

CLASS 332

11D 3,855,555

CLASS 333

28R 3,854,659
72 3,855,556

CLASS 335

42 3,855,557
132 3,855,558
207 3,855,559
302 3,855,560

CLASS 336

83 3,855,561

CLASS 337

75 3,855,562
221 3,855,563

CLASS 338

48 3,855,564
171 3,855,565

CLASS 339

49R 3,855,566
61M 3,855,567
95R 3,855,568
103R 3,854,787
176M 3,854,788
176T 3,855,569
177R 3,854,789
198GA 3,854,790
267 3,855,570

CLASS 340

26 3,855,571
52F 3,855,572
53 3,855,573
146.2 3,855,576
148 3,855,574
167R 3,855,575
172.5 3,855,577
173LM 3,855,579
173LS 3,855,582
3,855,583
173NC 3,855,578
173R 3,855,580
3,855,581
174MC 3,855,584
251 3,855,586
3,855,587
309.4 3,855,588
347AD 3,855,585
3,855,589
413 3,855,590

CLASS 343

5LS 3,855,591
6.8LC 3,855,592
7A 3,855,593
7.5 3,855,594
8 3,855,595
112D 3,855,596
768 3,855,597
840 3,855,598

CLASS 346

62 3,855,599
74ES 3,855,600

CLASS 350

3.5 3,854,791
96B 3,854,792
160LC 3,854,751
3,854,793
160R 3,854,794
3,854,795
164 3,854,796
214 3,854,797
226 3,854,798
310 3,854,799
3,854,800

CLASS 351

118 3,854,801

CLASS 352

40 3,854,802
72 3,854,803
78R 3,854,804
121 3,854,805
130 3,854,806

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3,855,089	3,854,286	3,854,641	3,855,091	3,854,537	3,854,915
3,855,453	3,854,432	3,855,153		3,854,541	3,855,045
3,855,512	3,854,539	3,855,386	55 : 3,854,230	3,854,551	3,855,046
3,855,592	3,854,540	3,855,617	3,854,246	3,854,573	3,855,057
3,855,595	3,854,592		3,854,337	3,854,733	3,855,072
	3,854,614	54 : 3,854,192	3,854,413	3,854,736	3,855,235
53 : 3,854,215	3,854,619	3,854,451	3,854,448	3,854,767	3,855,520

Design Patents

6 : 233,933	8 : 233,919	25 : 233,935	233,940	34 : 233,948	233,958
233,936	233,931	26 : 233,918	233,941	36 : 233,937	37 : 233,924
233,945	12 : 233,953	233,920	233,950	233,938	39 : 233,932
233,947	233,954	233,921	29 : 233,949	233,939	48 : 233,946
233,951	233,956	27 : 233,925	33 : 233,934	233,955	233,952
233,957					

Plant Patents

6 : 3,664	3,666	36 : 3,661	3,662	39 : 3,668	55 : 3,669
6 : 3,665	17 : 3,667				

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U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, *Secretary*

PATENT OFFICE
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